SERVICE MANUAL

T4.80F / T4.90F / T4.100F / T4.110F
T4.80LP / T4.90LP / T4.100LP / T4.110LP
Tier 4A (interim)

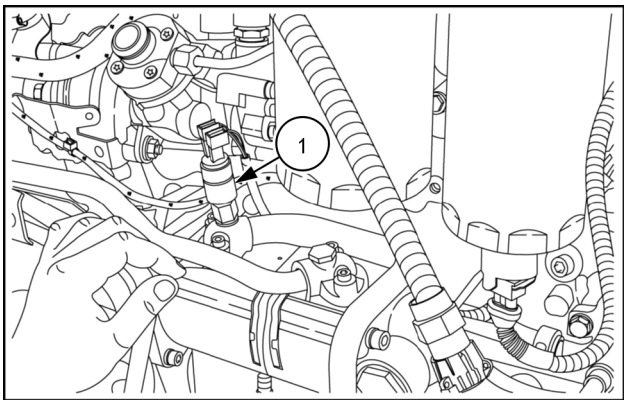
Tractor

PIN HLRT410FHHLT06645 and above

Part number 51526006
1st edition English
November 2018

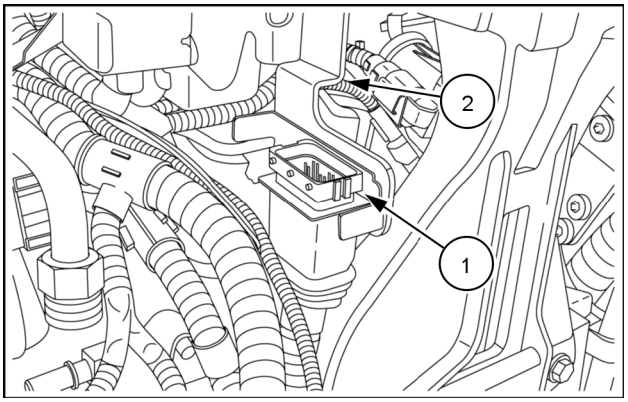
NEW HOLLAND AGRICULTURE

35. Carefully clean the area around the connector **(1)** of the hydraulic fluid pressure sensor.
36. Correctly position the connector cable **(1)** of the hydraulic fluid pressure sensor.
37. Connect the connector **(1)** of the hydraulic fluid pressure sensor.



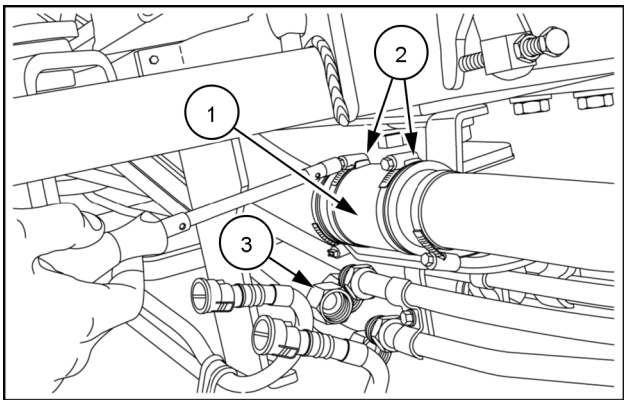
MOIL16TR01460AA 12

38. Carefully clean the area around the connector **(1)**.
39. Fasten the connector **(1)** to the support bracket **(2)**.
40. Connect the connector **(1)**.



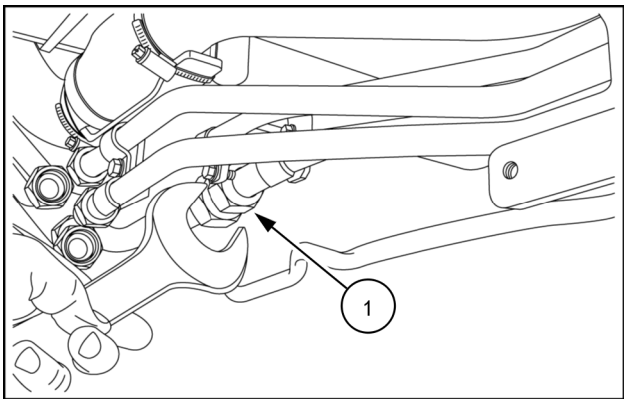
MOIL16TR01458AA 13

41. Carefully clean the area around the sleeve **(1)** of the intermediate delivery pipe connected to the transmission oil filter.
42. Connect the sleeve **(1)** of the intermediate delivery pipe connected to the transmission oil filter.
43. Tighten the two screw collars **(2)** on the sleeve **(1)** of the intermediate delivery pipe connected to the transmission oil filter.
44. Tighten the screw collar **(3)** fixing the sleeve **(1)** to the intermediate delivery pipe connected to the transmission oil filter.



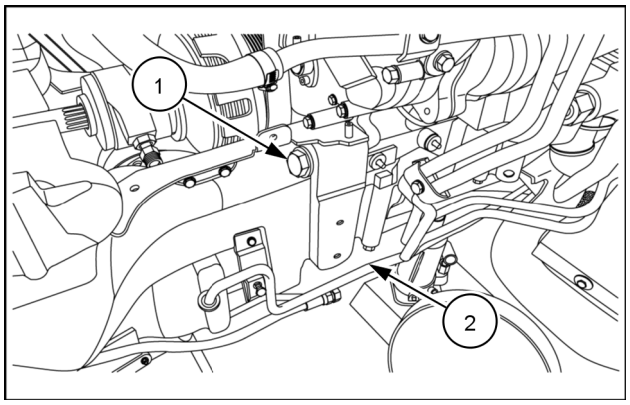
MOIL16TR01457AA 14

45. Carefully clean the area around the coupling **(1)** of the intermediate delivery pipe connected to the transmission oil filter.
46. Correctly connect the coupling **(1)** of the intermediate delivery pipe connected to the transmission oil filter.
47. Tighten the coupling **(1)** of the intermediate delivery pipe connected to the transmission oil filter.



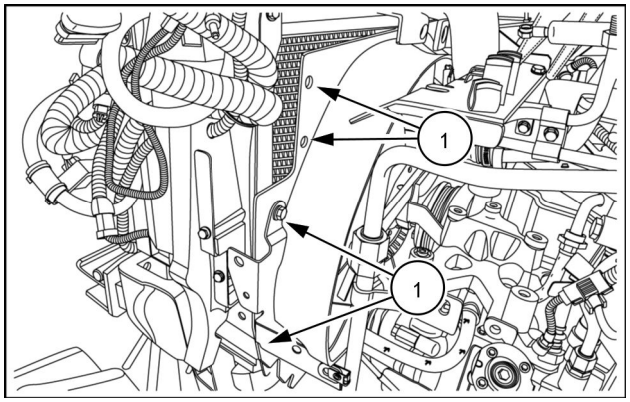
MOIL16TR01456AA 15

13. Correctly position the engine in respect of the front axle of the vehicle.
14. Tighten the screw **(1)** and the nut **(2)** which join the engine to the front axle on the left-hand side of the vehicle and lock in place, tightening to the prescribed torque.
15. Repeat the operation above for the screws on the right-hand side of the vehicle and lock in place, tightening to the prescribed torque.
16. Remove the chains/straps used for lifting the engine.
17. Remove the eyebolts used to lift the engine.



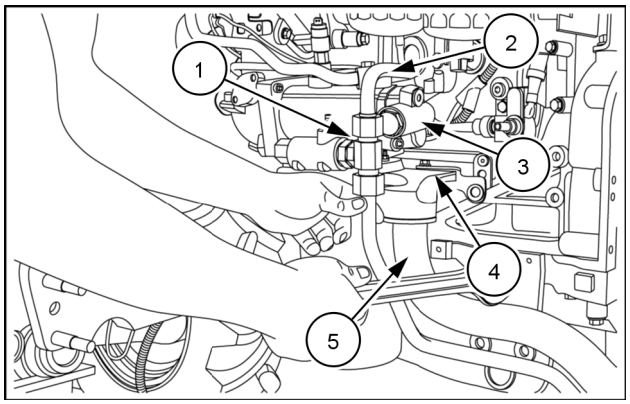
MOIL16TR01617AA 3

18. Tighten the four screws **(1)** which fix the radiator air conveyor onto the left-hand side of the vehicle.
19. Repeat the operation for the four screws which fix the radiator air conveyor onto the right-hand side of the vehicle.



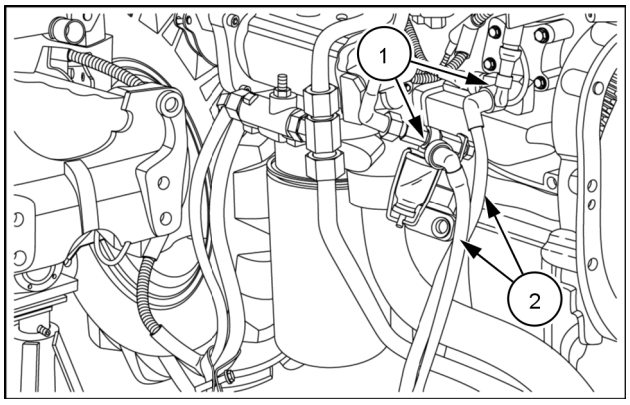
MOIL16TR01613AA 4

20. Carefully clean the area around the three-way connector **(1)** of the oil pump **(3)** delivery pipe **(2)**.
21. Correctly take the oil pump **(3)** delivery pipe **(2)** from its housing and place in a suitable area.
22. Tighten the three-way connector **(1)** of the oil pump **(3)** delivery pipe **(2)**.
23. Correctly position the oil inlet pipe **(5)**.
24. Screw in the screw **(4)** securing the oil inlet pipe **(5)**.
25. Reattach the transmission oil filter - See **Transmission oil filter - Install mount (21.104)**.



MOIL16TR01612AA 5

26. Carefully clean the area around the quick connectors **(1)** of the fuel delivery and return pipes **(2)**.
27. Correctly connect the quick connectors **(1)** of the fuel delivery and return pipes **(2)**.



MOIL16TR01611AA 6

Index

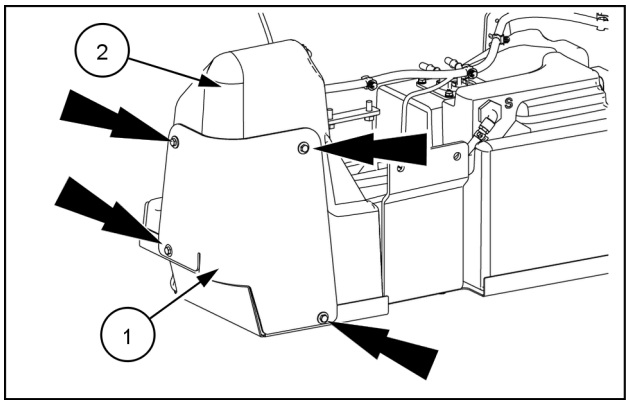
Engine - 10

Pump drives - 114

Auxiliary fuel tank - Remove Support

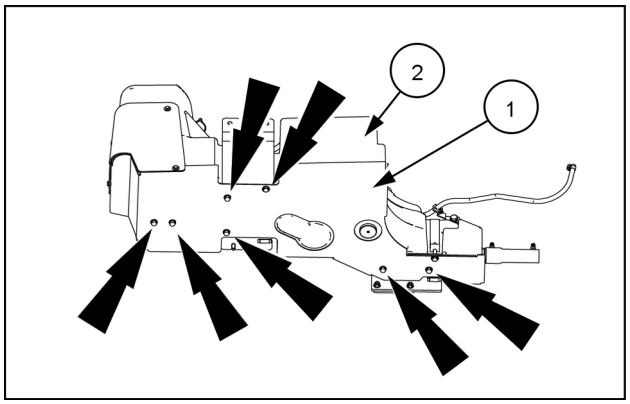
Prior operation:
Auxiliary fuel tank - Remove (10.216)

1. Loosen the bolts indicated and remove the support **(1)** from the tank **(2)**.



MOIL17TR03219AA 1

2. Loosen the bolts indicated and remove the lower part of the support **(1)** from the tank **(2)**.



MOIL17TR03220AA 2

Exhaust pipes - Remove - Horizontal end section

⚠ WARNING

Hot surface possible!
Wait for all components to cool before performing any operation.
Failure to comply could result in death or serious injury.

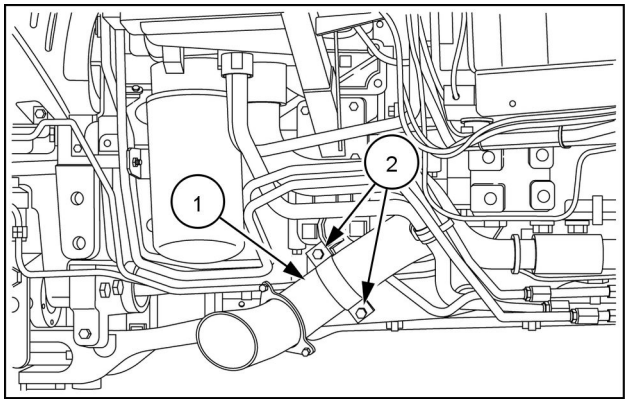
W0251A

⚠ CAUTION

Hot area!
Use care when working near hot components. Wear protective gloves.
Failure to comply could result in minor or moderate injury.

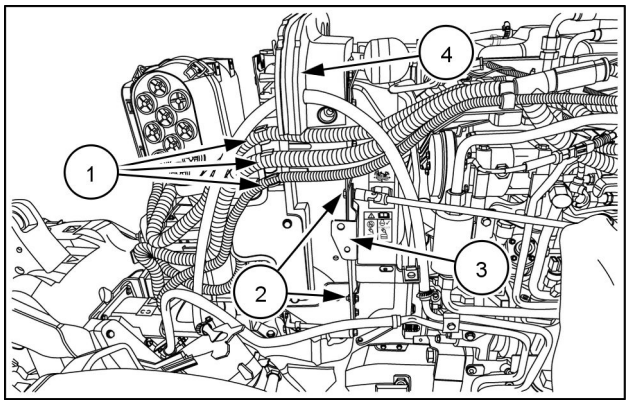
C0034A

1. Thoroughly clean the area where the end section of the exhaust pipe **(1)** is attached.
2. Loosen the two screws **(2)** for the end section of the exhaust pipe.



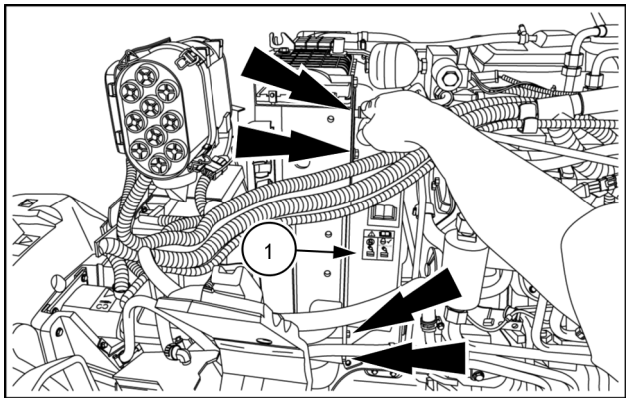
MOIL16TR04002AA 1

9. Release the three cables **(1)** on the related fasteners on the vehicle left-hand side.
10. Loosen the two screws **(2)** of the left-hand engine side panels mounting bracket **(3)**.
11. Remove the left-hand engine side panels mounting bracket **(3)** and store it in a suitable place.
12. Remove the upper gasket **(4)** from the top of the radiator, moving it on the left-hand side of the vehicle.



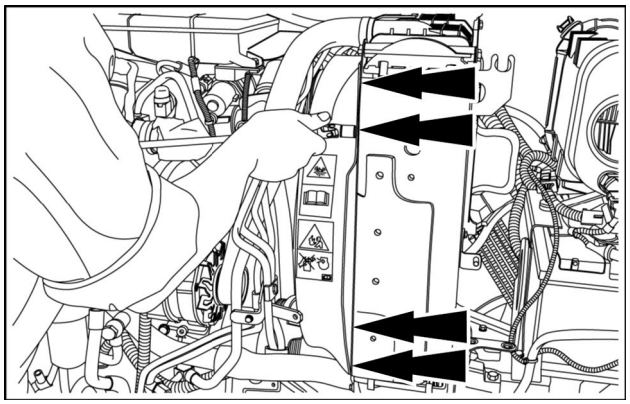
MOIL16TR01038AA 4

13. Loosen the four air conveyor retaining screws indicated **(1)** on the radiator left-hand side.



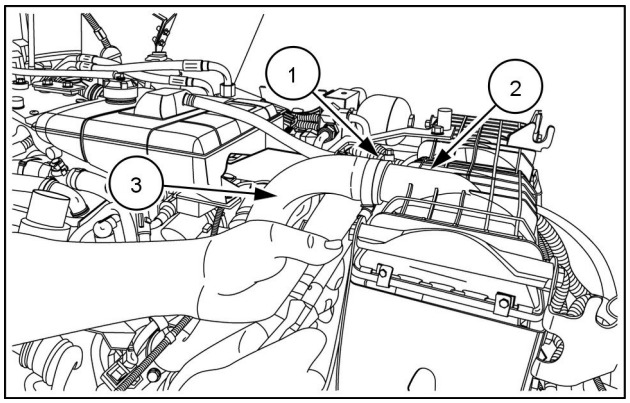
MOIL16TR01039AA 5

14. Loosen the four air conveyor retaining screws indicated on the radiator right-hand side.



MOIL16TR01040AA 6

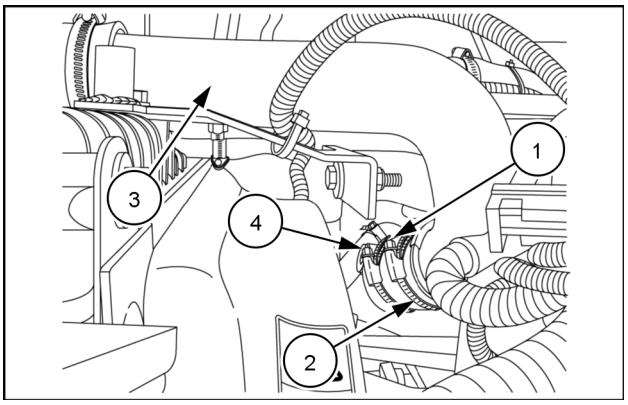
15. Loosen the screw collar **(1)** of the radiator upper sleeve **(2)**.
16. Prearrange two suitable caps for closing the upper pipe **(3)** and the upper sleeve **(2)** of the radiator.
17. Disconnect the upper pipe **(3)** from the radiator upper sleeve **(2)**.
18. Accurately close the radiator upper pipe **(3)** and upper sleeve **(2)**.



MOIL16TR01041AA 7

4. Loosen the screw **(1)** to loosen the metal clamp **(2)**.
5. Carefully extract the aftercooler delivery line **(3)** from the sleeve and store it in a suitable place.

NOTE: *to facilitate the line disconnection procedure* ***(3)*** *it may be helpful to loosen also the metal clamp* ***(4)****.*

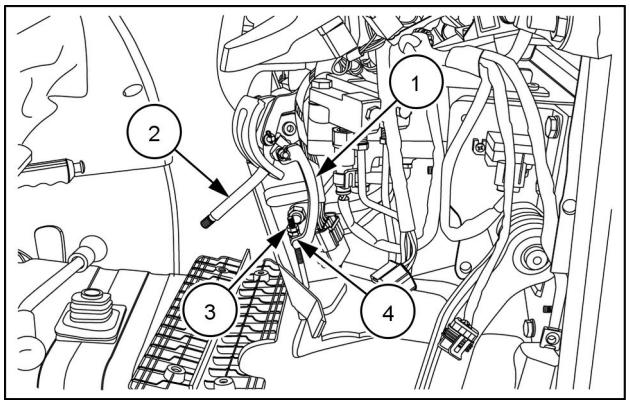


MOIL16TR01631AA 3

Power Take-Off (PTO) clutch release control link - Adjust

Prior operation:
A. Remove the right-hand lower panel of the instrument panel – See **Cab front panel - Remove - Right-hand side (90.160)**.

1. Thoroughly clean the area of the rear power-take off (PTO) control bracket **(1)**.
2. Start the engine and make some rear power-take off engagement and disengagement control manoeuvres in order to settle the cable.
3. Fully lower the rear power-take off (PTO) control lever **(2)**.
4. Position a spacer with thickness of **4 mm** (**0.157 in**) between the stop of the nut **(3)** and the control bracket bushing **(4)**.
5. Use the nut **(3)** to adjust the clearance.
6. Lock the nut **(3)** on the desired position and tighten the relevant lock nut.
7. Remove the spacer.
8. Start the engine and engage the rear power take-off (PTO).
9. Stop the engine and check that the power take-off (PTO) control lever returns automatically to the disengaged position.



MOIL16TR01265AA 1

Next operation:
A. Reconnect the right-hand lower panel of the instrument panel – See **Cab front panel - Install - Right-hand side (90.160)**.

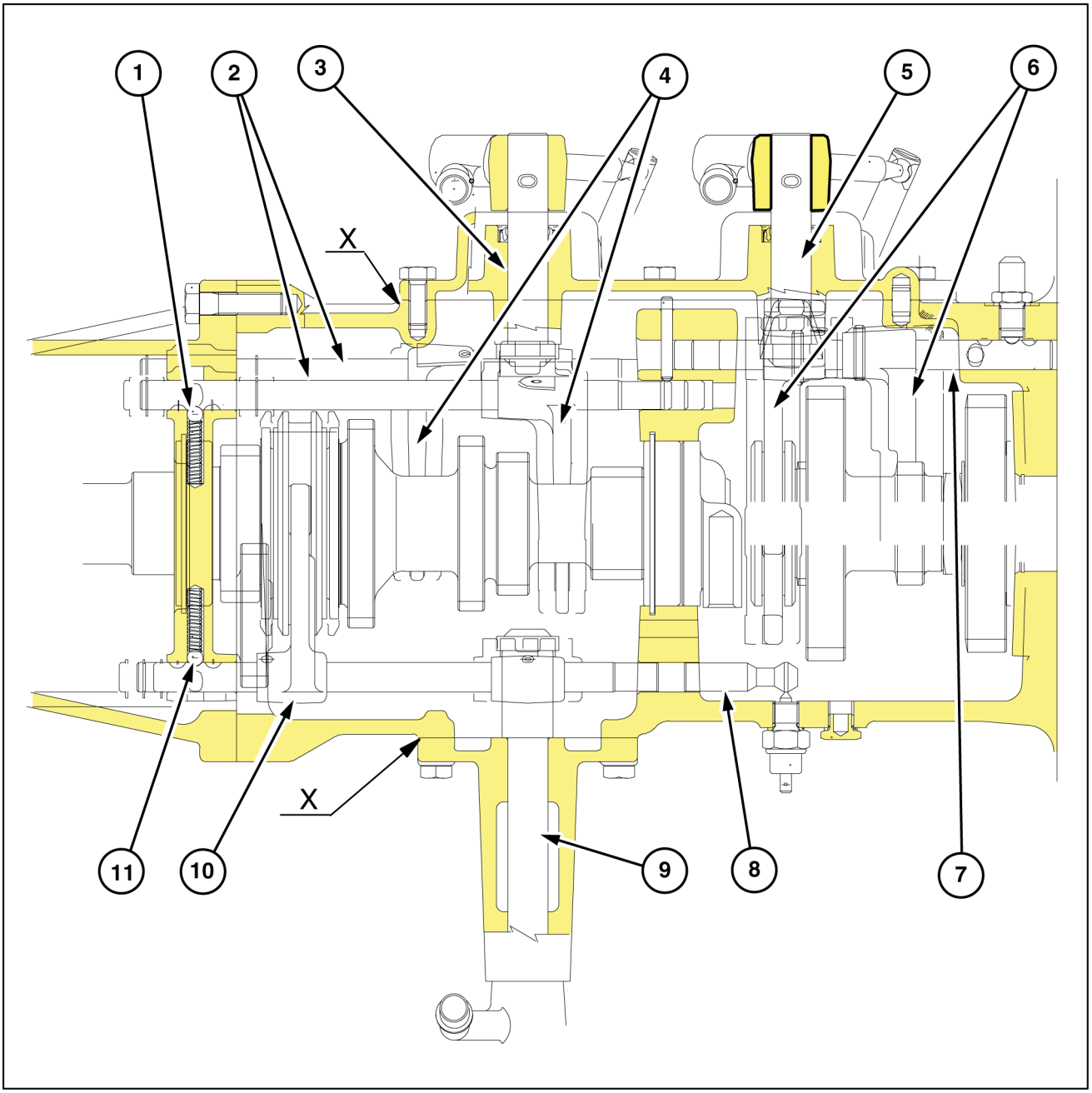
Clutch - Replace

Take the following action:

1. **Clutch - Remove (18.110)**

   NOTE: *Obtain a new clutch assembly.*

2. **Clutch - Install (18.110)**
3. Adjust the clutch pedal stroke for models with mechanical clutch control. — Refer to **Master clutch release control - Travel adjust (18.100)**



MOLI11F0084GB 2

Cross-sectional view of gearbox and range gear

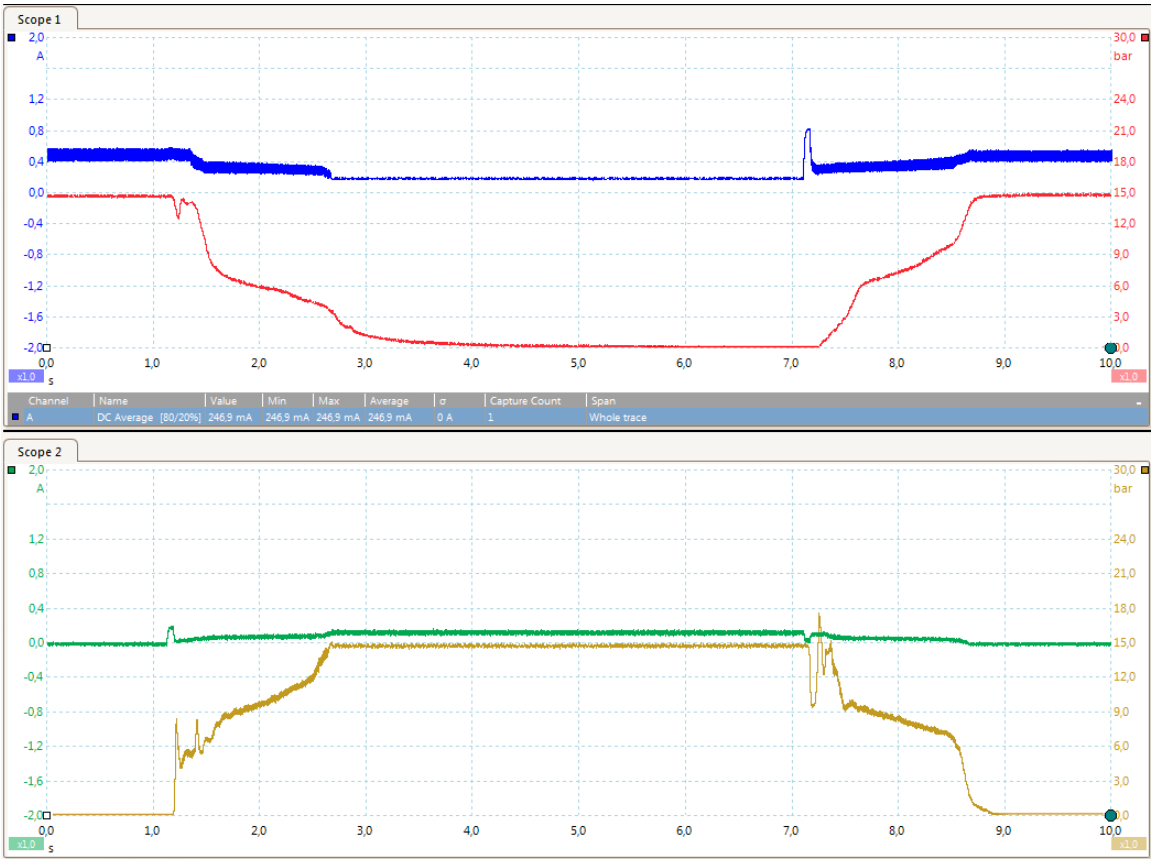
1. Spring and relative poppet ball
2. Gear engagement rods
3. Gear control external rod
4. Gear engagement forks
5. External control rod
6. Engagement forks
7. Engagement rod
8. Reverser engagement rod
9. Reverser control external rod
10. Reverser engagement fork
11. Detent spring and associated spring

NOTE: *On assembly apply a bead of sealing compound to the surfaces X as indicated on* ***Transmission drive housing - Reseal (21.114)****.*

15. Activate the clutch pressure test by selecting the “Two Clutch Hydraulic and Current Test” option.
16. Start the engine and run it at an idle speed of **1500 – 2000 RPM** until the transmission oil reaches a temperature between **50 – 80 °C** (**122 – 176 °F**).

NOTE: *To facilitate faster heating of the oil a by-pass can be used connected to the rear control valves when operated accordingly.*

17. With the engine running at **1000 RPM**, in 4th gear, fast range and reversing mechanism in FWD, operate the Hi-Lo control from the Lo position to the Hi position and then again to the Lo position.



MOIL18TR00855FA 11

18. The resulting graph shows the trend of the pressures detected on the control clutches for the Hi-Lo device and the currents that act on the respective contactors.
19. Repeat the test with the engine running at **2000 RPM** and a new pressure-current graph will be displayed.

Hi-Lo unit - Assemble

⚠ CAUTION

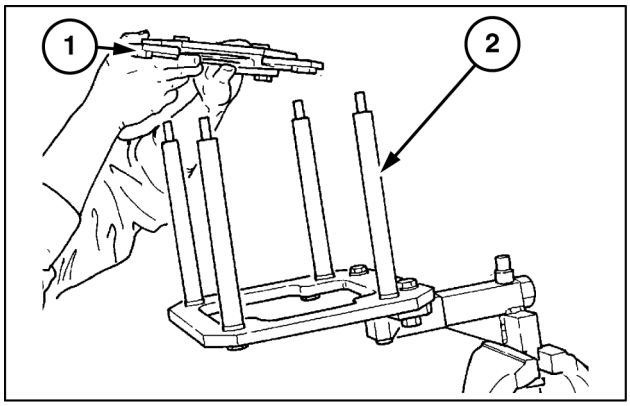
Pinch hazard!
Always use suitable tools to align mating parts.
DO NOT use your hand or fingers.
Failure to comply could result in minor or moderate injury.

C0044A

To refit the splitter device and creeper unit, proceed as follows:

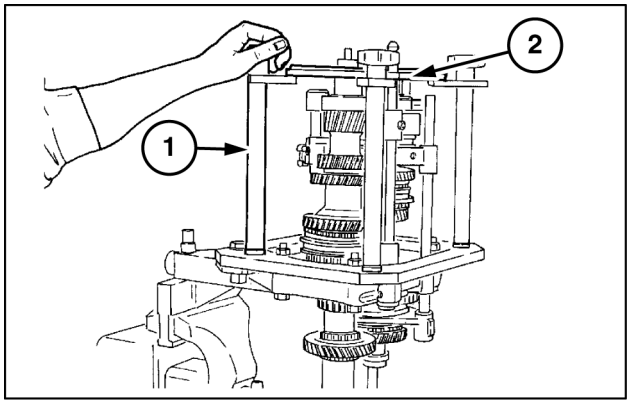
- Refer to the illustrations on **Transmission drive housing - Sectional view (21.118)**, **Creeper - Sectional view (21.160)** and **Creeper - Sectional view (21.160)**.
- Respect the tightening torques prescribed on **Mechanical transmission - General specification (21.114)**.
- Fit the grooved pin, creeper unit driven gear and the relative thrust washers, lock in position using the stop ring.
- Fit the synchronizer, the stop ring and the control fork.
- Assemble the splitter driven gear, the cotter, the synchronizer engaging ring and circlip.
- Assemble the splitter driving gear and relative circlip.
- Fit the splitter driving gear and circlip.
- Fit the lubrication line.
- Fit tools **380001616** and **380001615** (respectively) on the driven and driving shafts.
- Refit the gearbox assembly as described in **Creeper - General specification (21.160)**.
- Install the gearbox casing as described in operation **Transmission drive housing - Remove (21.118)** or **Transmission drive housing - Install (21.118)**.
- Install the cab as described in operation **Cab and platform - Install (90.150)**.

18. Fit tool **380001614 (2)** in a vice and remove the mobile part **(1)** of the tool.



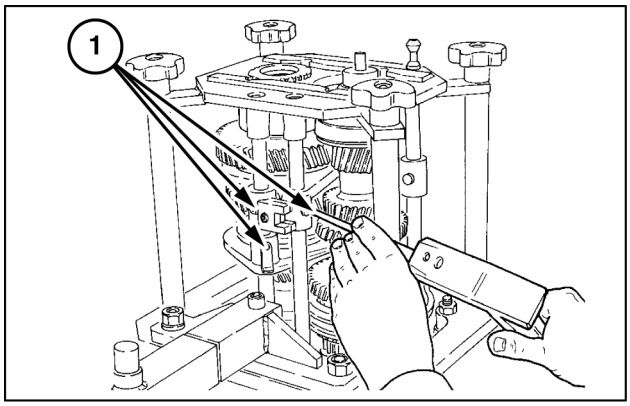
MOLI11F0144AB 15

19. Fit the gearbox unit to the tool **380001614 (1)** and refit the mobile part **(2)** of the tool.



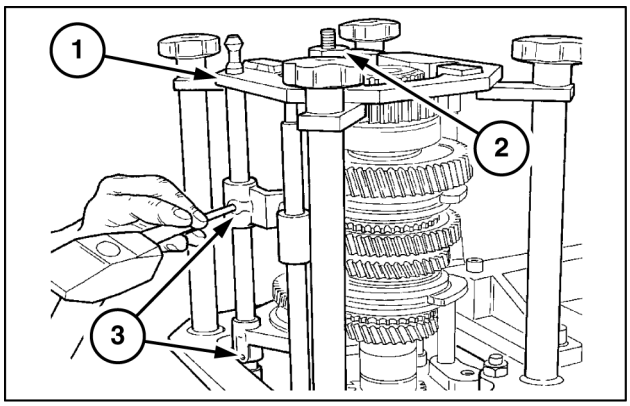
MOLI11F0145AB 16

20. Remove the pins **(1)** to free the gearbox control forks (on one side).



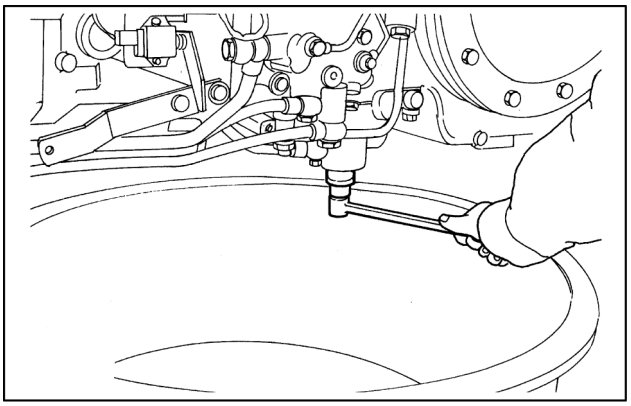
MOLI11F0146AB 17

21. Extract the pins **(1)** on the other side of the gearbox and remove the upper part **(1)** of tool **380001614**, tool **380001615 (2)** from the driving shaft and retaining tool **380001616** from the driven shaft.



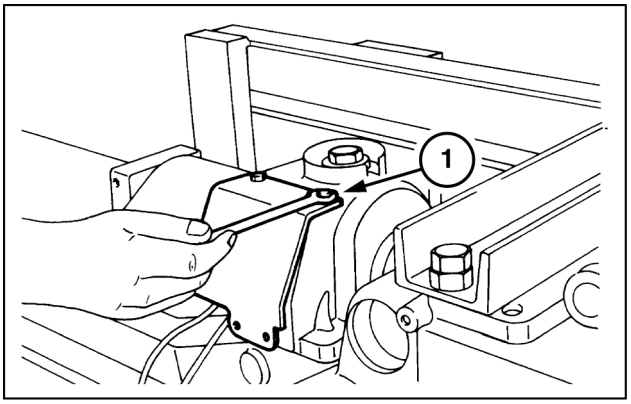
MOLI11F0147AB 18

4. Remove the drainage plug of the drive gear casing and collect the oil in a suitable container.



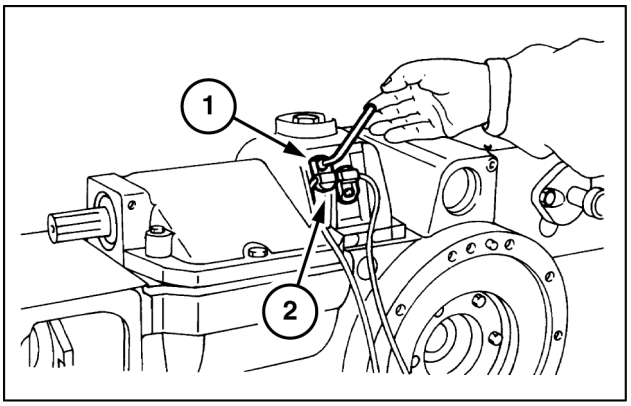
MOLI11F0221AA 4

5. Remove the sensors **(1)** guard cover on the drive gear casing.



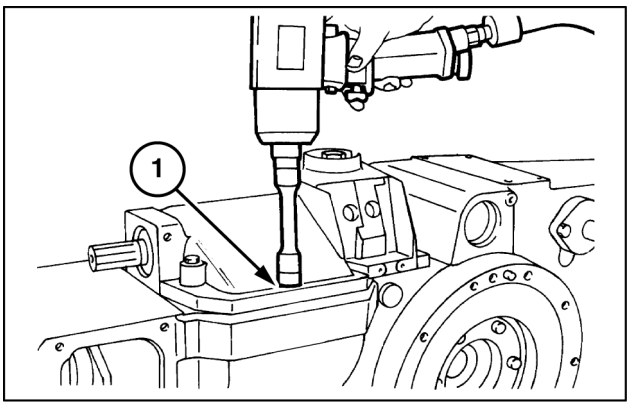
MOLI11F0222AB 5

6. Unscrew the retaining bolts **(1)** on the sensors **(2)** and remove from the drive gear casing.



MOLI11F0223AB 6

7. Unscrew the eight drive gear housing retaining bolts **(1)** on the transmission gearbox.



MOLI11F0224AB 7

Powered front axle - Remove

⚠ DANGER

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.
Failure to comply will result in death or serious injury.

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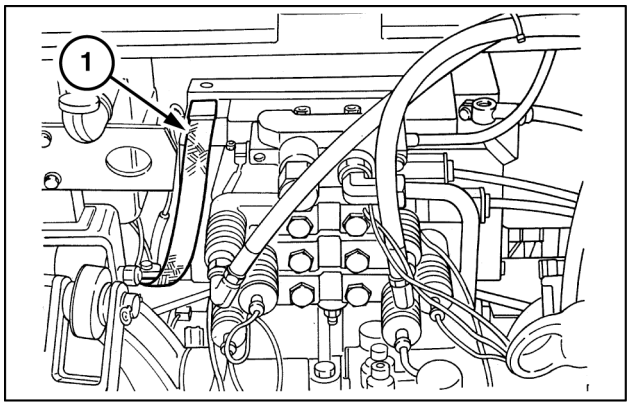
Proceed as follows:

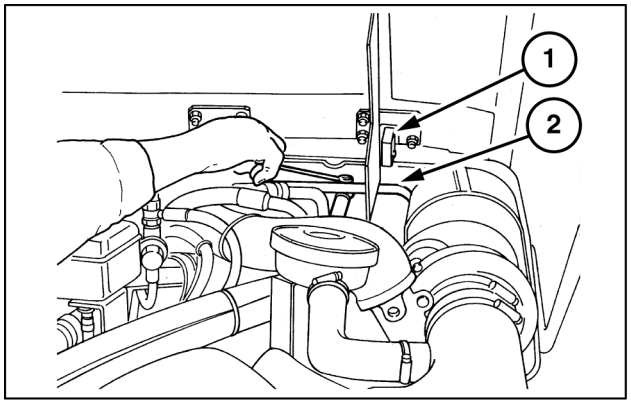
NOTE: *The front axle assembly can be removed from the tractor either with or without previously removing the drive shaft. The description below refers to removal of the front axle with the drive shaft installed on the tractor. For removal of the drive shaft to* ***Electro-hydraulic control - General specification (23.202)****.*

1. Disconnect the negative battery cable **(1)**.



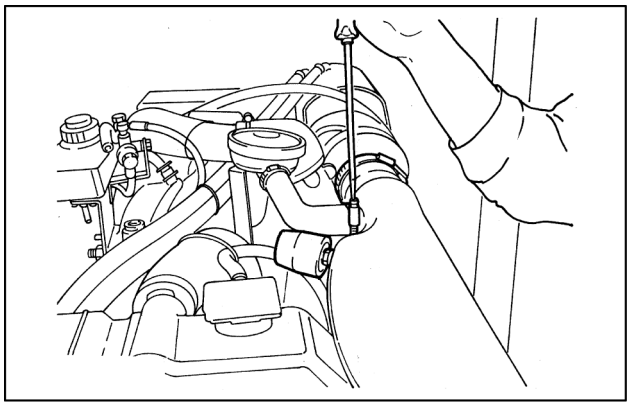
MOLI11F0240AB 1

2. Unscrew the bolts securing the pivot bracket **(1)** to the support **(2)** and remove the bonnet.



MOLI11F0241AB 2

3. Disconnect the electrical connections from the thermostarter **(4)**, unscrew the front clamp **(1)**, rear clamp and the one **(2)** on the vapour recycling pipe. Remove the intake manifold **(3)**.



MOLI11F0242AA 3

8. Remove the differential lock piston.

⚠ CAUTION

Pinch hazard!
Always use suitable tools to align mating parts.
DO NOT use your hand or fingers.
Failure to comply could result in minor or moderate injury.

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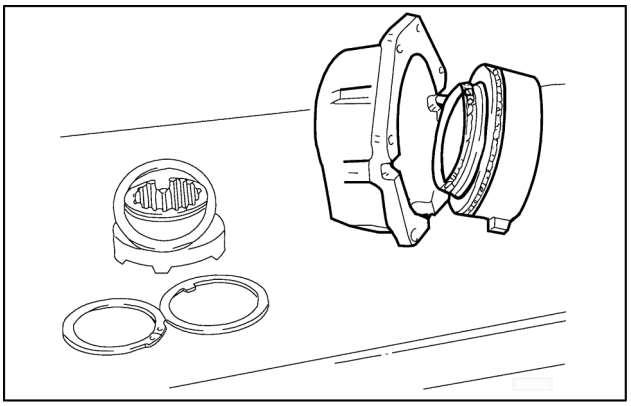
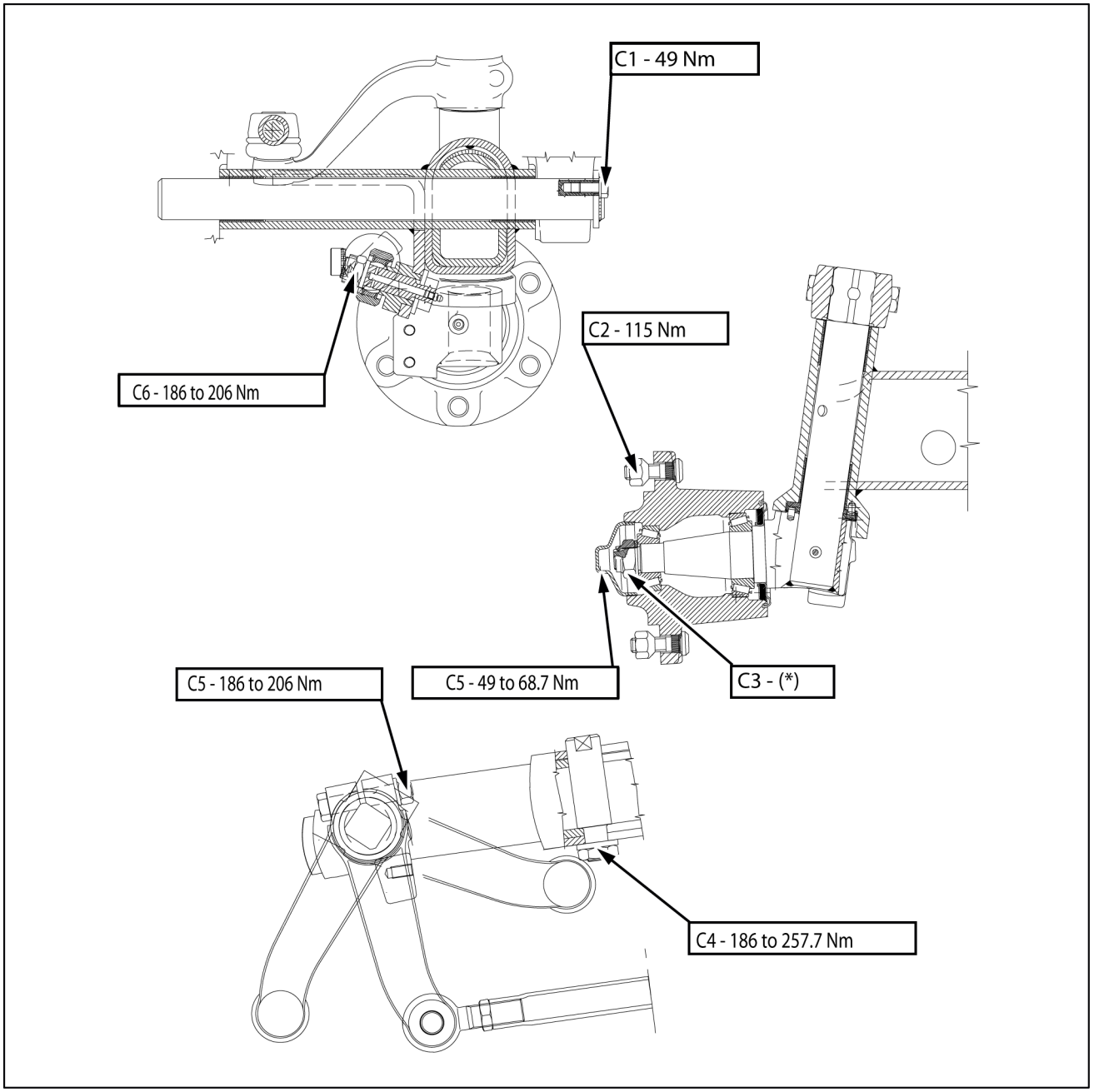


MOLI11F0306AA 8

9. To refit the differential lock assembly, proceed as follows:
   - Refer to the instructions on **Powered front axle - Sectional view - Front axle with differential lock (25.100)** for the positioning of the various parts.
   - Respect the tightening torque values prescribed on **Powered front axle - Torque (25.100)**.
   - Carefully check the condition of the two O-ring seals installed on the piston.
   - Install the piston, complete with O-ring seals.
   - Install the sliding sleeve and the relative thrust washers.
   - Assemble the differential lock sleeve and clip.
   - Fit the clutch bell housing complete with spring and piston, securing in position following the removal instructions on **1** to **8** for removal.
   - Refit the oil delivery union.

Non-powered front axle - Torque

Torque rates

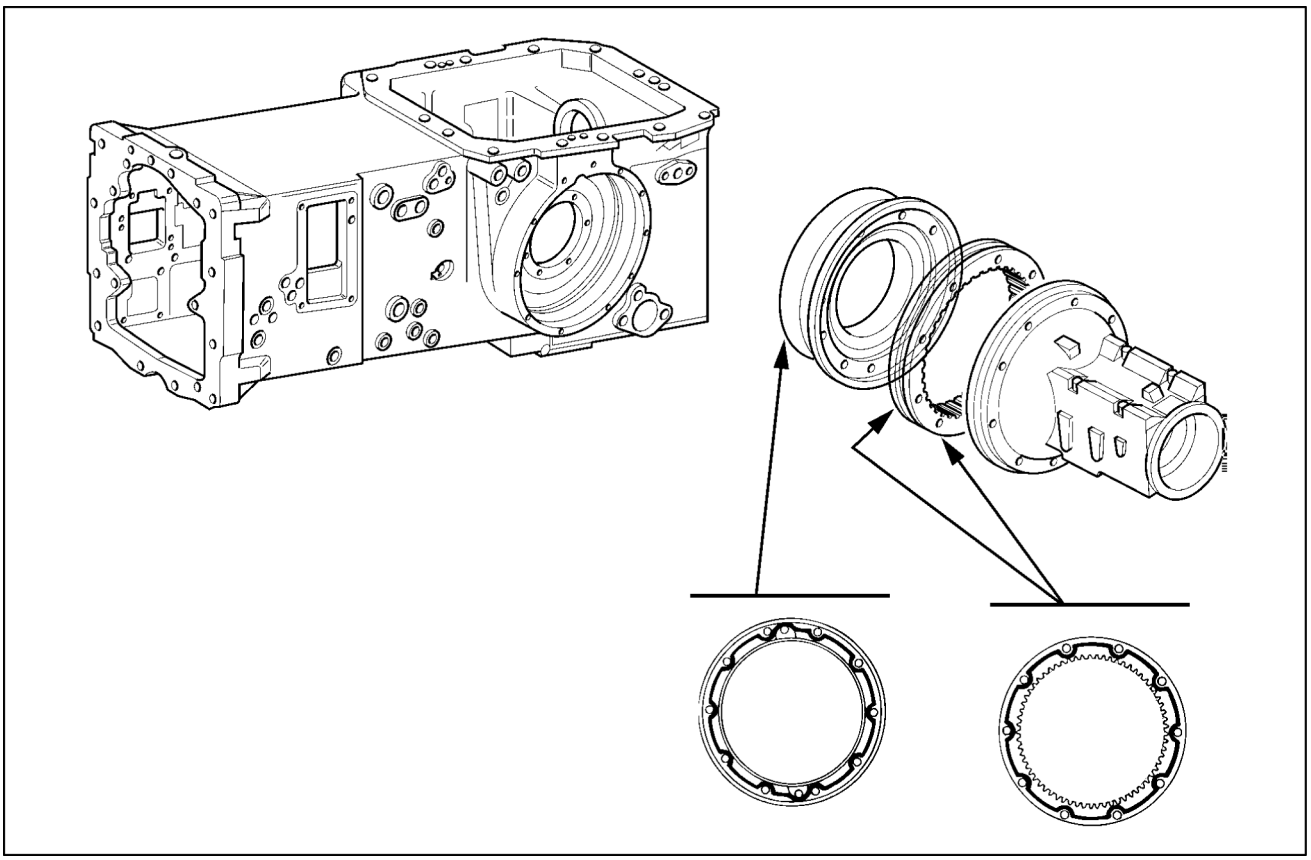


MOLI11F0807GB 1

C_1	Axle pivot pin retaining bolt	C_5	Grease cover for wheel hub bearings
C_2	Disk to hub retaining bolt	C_6	Nut for stub axle pin control lever fixing screw
C_3	Bearings adjuster nut	C_7	Nut securing cylinder to fulcrum pin
C_4	Axle end retaining nut		

(*) See operations **Wheel hub - Disassemble (25.108)** and **Wheel hub - Disassemble (25.108)**, **Wheel hub - Disassemble (25.108)**.

Planetary final drive - Join



MOLI11F0369FA 1

Diagram of seal compound application for brake assembly and final drives on the transmission casing

Power Take-Off (PTO) - 31

Front Power Take-Off (PTO) control - 142

T4.100F With cab [HLRT410FVHLT06687 -], T4.100F Without cab [HLRT410FHHLT06645 -], T4.100LP With cab [HLRT410LJHLT07888 -], T4.100LP Without cab [HLRT410LTHLT07868 -], T4.110F With cab [HLRT411FHHLT05607 -], T4.110F Without cab [HLRT411FJHLT07110 -], T4.110LP With cab [HLRT411LKHLT08505 -], T4.110LP Without cab [HLRT411LLHLT08186 -], T4.80F With cab [HLRT480FTHLT07324 -], T4.80F Without cab [HLRT480FKHLT07195 -], T4.80LP With cab [HLRT480LEHLT07889 -], T4.80LP Without cab [HLRT480L*JLT*** -], T4.90F With cab [HLRT490FHHLT07874 -], T4.90F Without cab [HLRT490FAHLT07208 -], T4.90LP With cab [HLRT490LHHLT07864 -], T4.90LP Without cab [HLRT490LPHLT07434 -]**

Contents

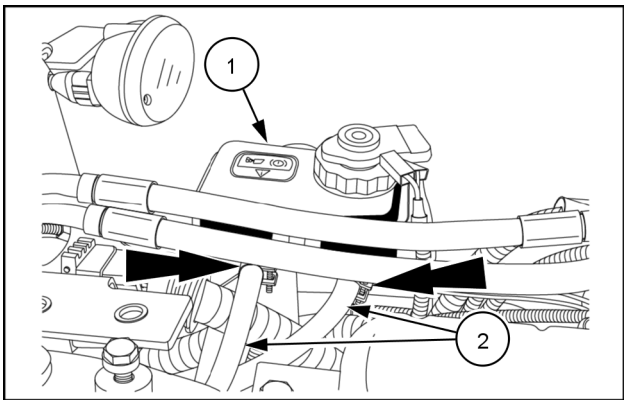
Brakes and controls - 33

Hydraulic service brakes - 202

(*) See content for specific models

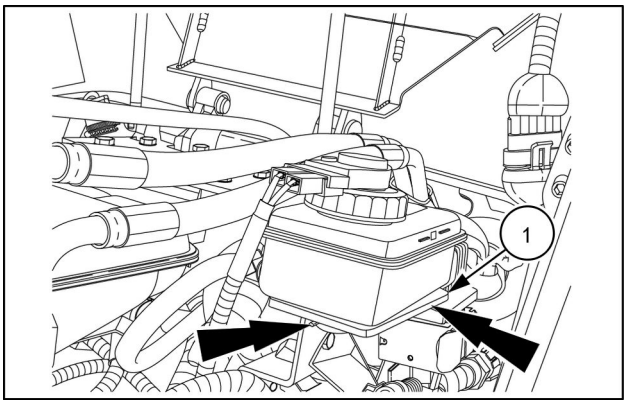
Brake fluid reservoir - Install

1. Recover and thoroughly clean the brake fluid reservoir **(1)**.
2. Thoroughly clean the brake lines **(2)**.
3. Correctly position the two indicated clamps and connect the lines **(2)** to the brake fluid reservoir **(1)**.
4. Tighten the two clamps indicated.



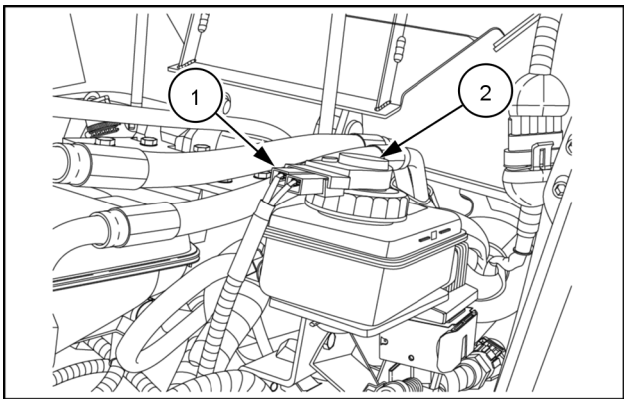
MOIL15TR02964AA 1

5. Thoroughly clean the brake fluid reservoir support bracket **(1)**.
6. Correctly position the reservoir on the support bracket **(1)**.
7. Correctly insert the two indicated clips that secure the reservoir to the support bracket.



MOIL15TR02121AA 2

8. Connect the connector **(1)** of the brake fluid reservoir level sensor **(2)**.



MOIL15TR02121AA 3

Next operation:
A. Connect the battery negative prong (-) - See **Battery cable - Connect (55.302)**.

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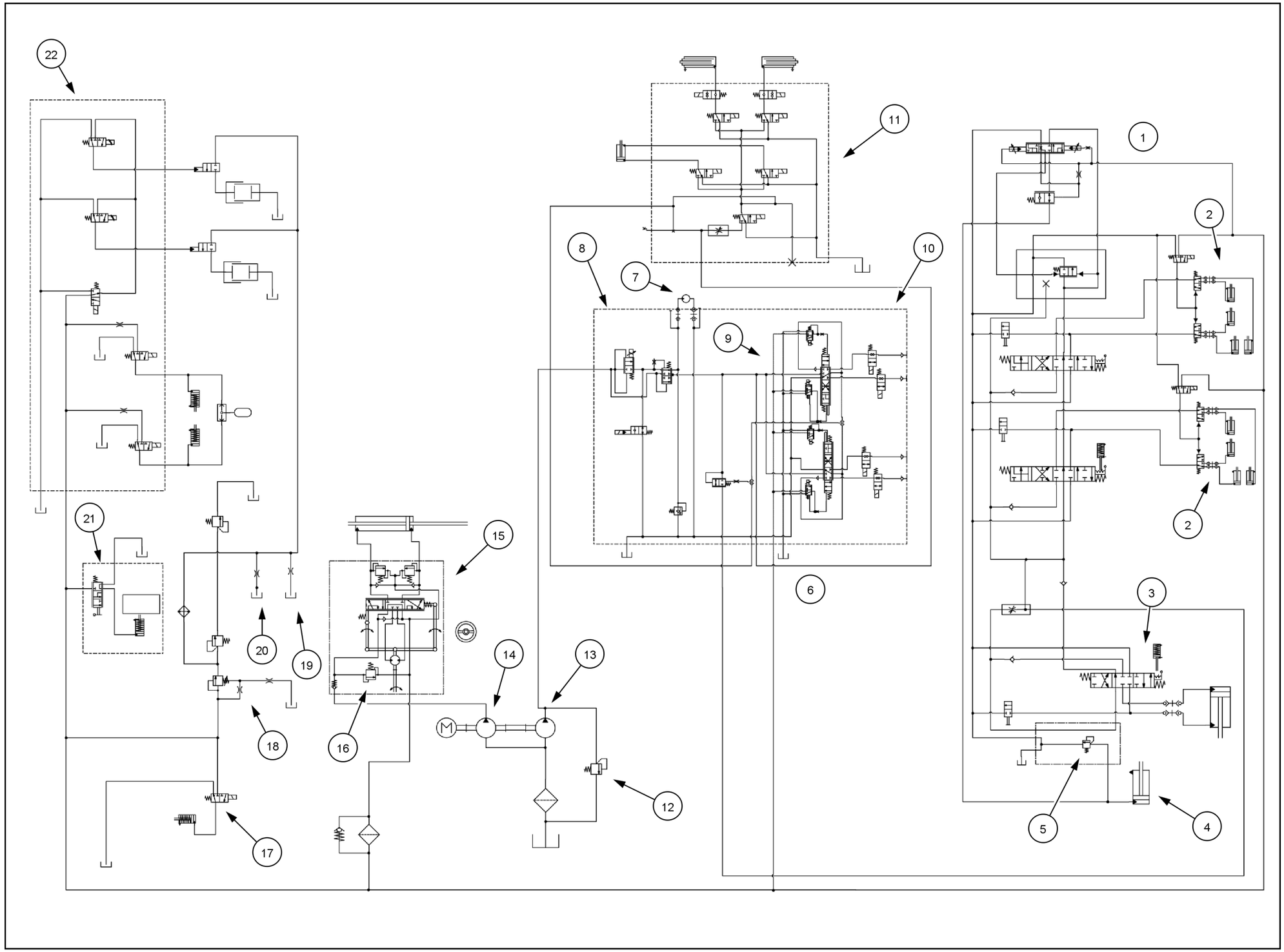
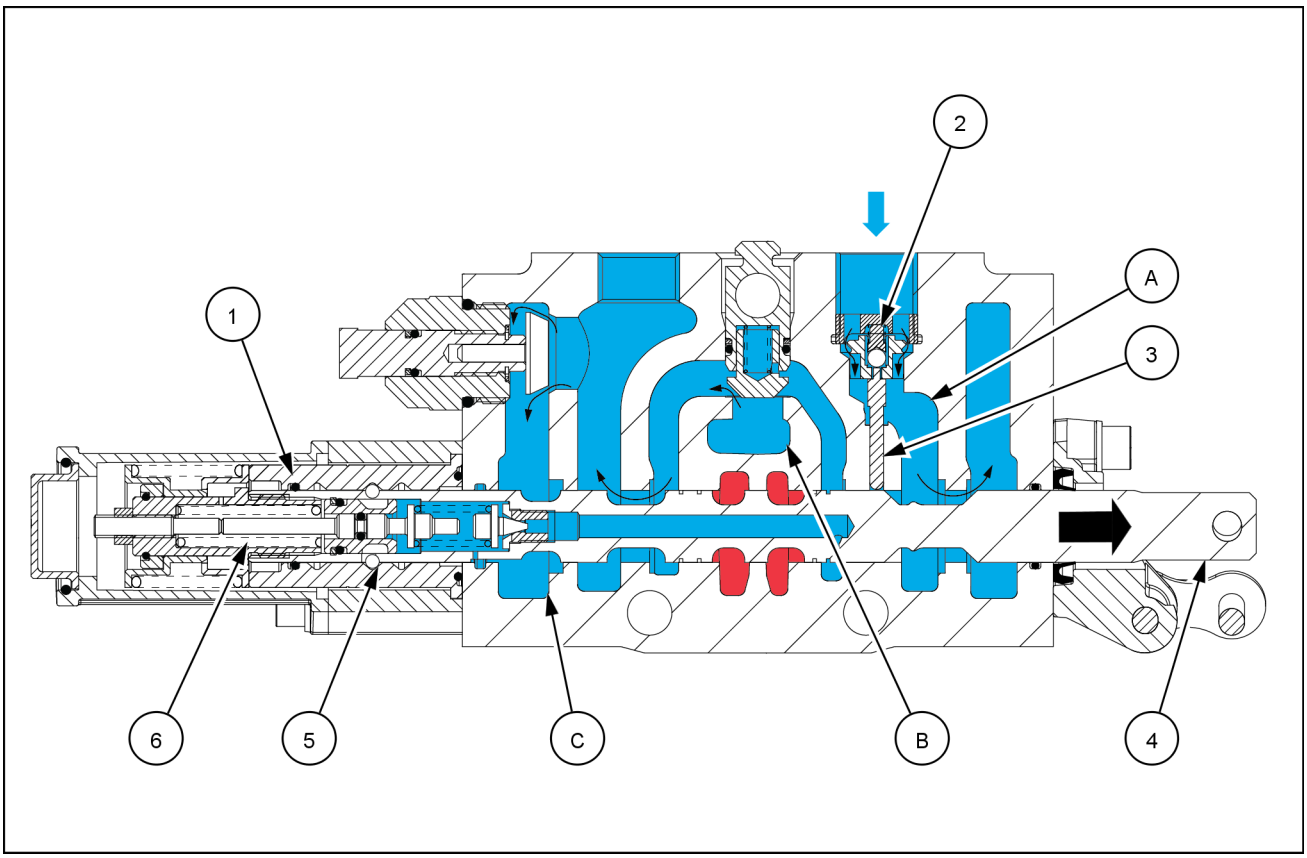
Brakes and controls - 33

Parking brake or parking lock - 110



MOIL16TR01158HA 1



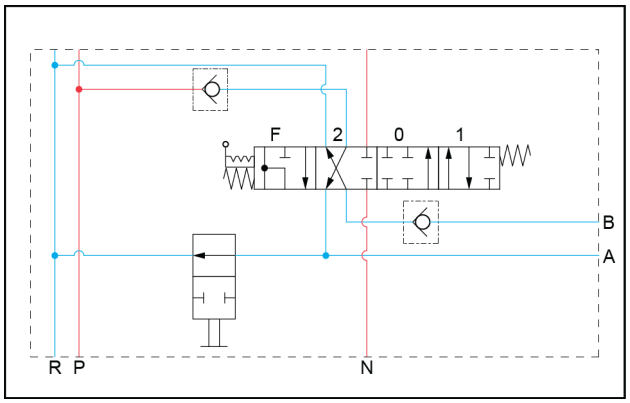
MOIL15TR02974FA 5

Control valve phase - Lever in position “2”

Pressurized oil (**190 bar** (**2755 psi**)

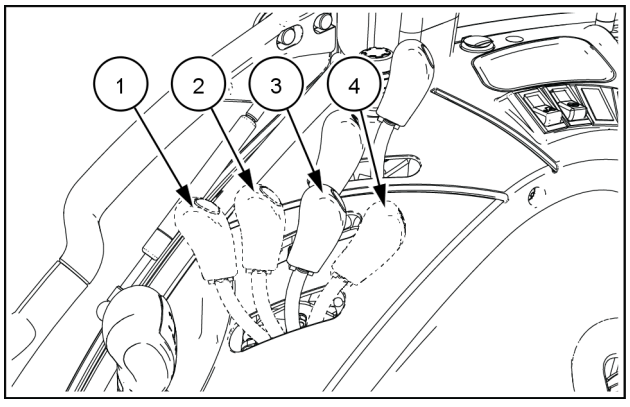
Exhaust oil

Pushing the control lever in the cab the control valve spool **(4)** moves in the direction of the arrow: the locking balls **(5)** enter in the stop point in the support **(1)**, remaining locked by the thrust of the spring **(6)**, and hold the spool. The spool displacement connects the oil supply line **(B)** directly to the exhaust in transmission through the line **(C)**. The pin **(3)**, pressed by the spool **(4)**, keeps the non-return valve **(2)** open, allowing the oil to be exhausted in the transmission through the "+" port and the line **(A)**.
At the end of the operation manually return the spool **(4)** in the neutral position operating on the control lever in the cab.



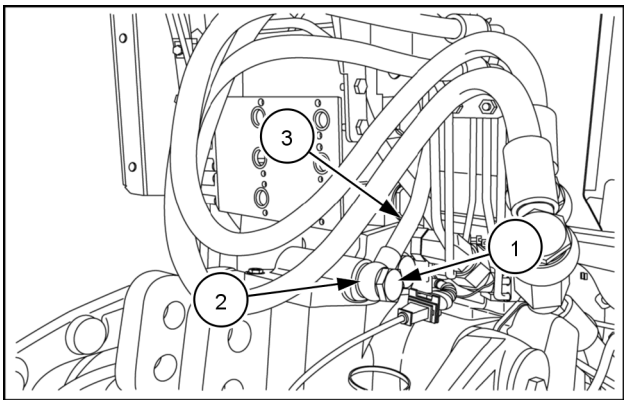
MOIL15TR02981AA 6

- Floating position **(1)** (not available with single-acting control valve)
- Lowering or retraction position **(2)**
- Neutral position **(3)**
- Lifting or extension position **(4)**



MOIL16TR00959AA 7

7. Recover and thoroughly clean the oil delivery line **(1)** to the rear lift.
8. Replace the seals of the fitting **(2)**.
9. Correctly connect the fitting **(2)** to the rear control valves body and the screw **(1)**. Disconnect the fitting **(2)** of the line **(3)**.
10. Remove the line **(3)** from its seat and store it in a suitable place.



MOIL16TR03155AA 5

Next operation:
A..Reconnect the rear control valves – See **Remote control valve - Install (35.204)**.

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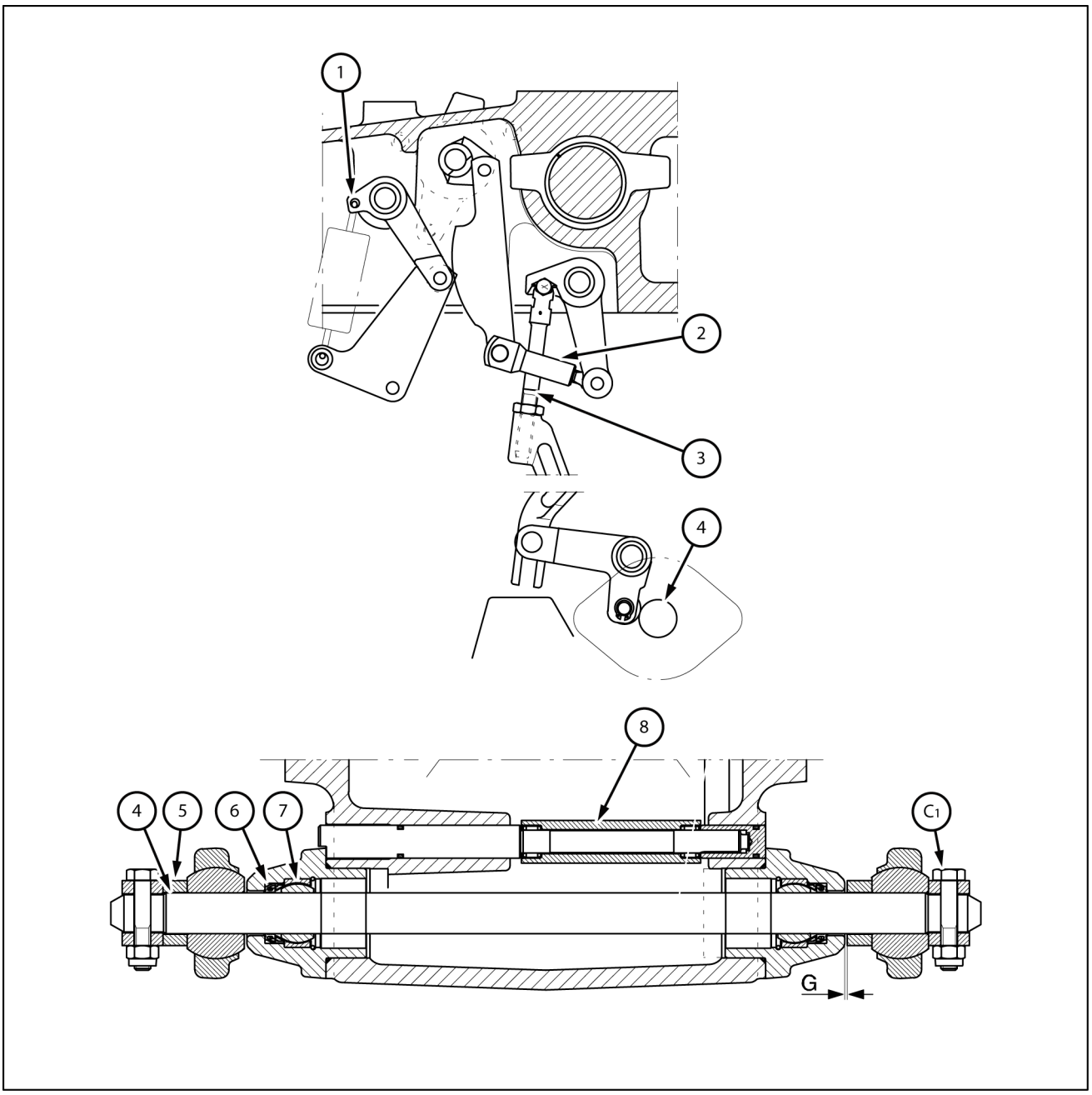
Three-point hitch hydraulic adjustment - 124

Rear three-point hitch - Sectional view



MOLI11F0442GB 1

Draft control device cross-sectional views

C1. Spacer ring and lower lift arm retaining bolt.
G= **1.5 – 5.42 mm** (**0.0590 – 0.2133 in**). End float of flex bar.
1. Lever mechanism unit in draft control operation
2. Lift adjustment rod in draft control operation
3. Draft transmission rod
4. Flex bar
5. Spacer
6. Seal
7. Ball bushing
8. Draft transmission lever

Hitches, drawbars, and implement couplings - 37

Rear three-point hitch linkage - 120

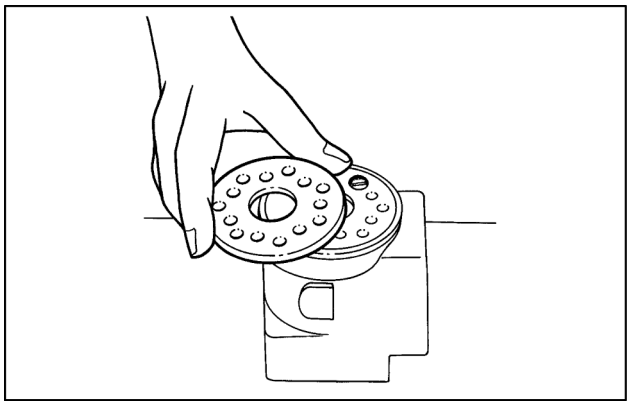
T4.100F With cab [HLRT410FVHLT06687 -], T4.100F Without cab [HLRT410FHHLT06645 -], T4.100LP With cab [HLRT410LJHLT07888 -], T4.100LP Without cab [HLRT410LTHLT07868 -], T4.110F With cab [HLRT411FHHLT05607 -], T4.110F Without cab [HLRT411FJHLT07110 -], T4.110LP With cab [HLRT411LKHLT08505 -], T4.110LP Without cab [HLRT411LLHLT08186 -], T4.80F With cab [HLRT480FTHLT07324 -], T4.80F Without cab [HLRT480FKHLT07195 -], T4.80LP With cab [HLRT480LEHLT07889 -], T4.80LP Without cab [HLRT480L*JLT*** -], T4.90F With cab [HLRT490FHHLT07874 -], T4.90F Without cab [HLRT490FAHLT07208 -], T4.90LP With cab [HLRT490LHHLT07864 -], T4.90LP Without cab [HLRT490LPHLT07434 -]**

Contents

Frames and ballasting - 39

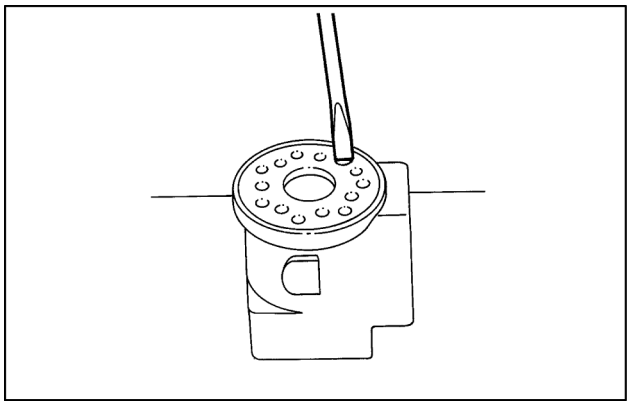
Ballasts and supports - 140

6. Extract the thrust washer.



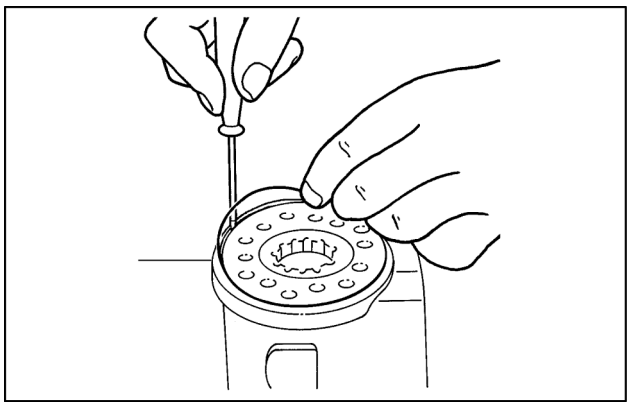
MOLI11F0740AA 5

7. Remove the threaded plug on the non-return valve seat.



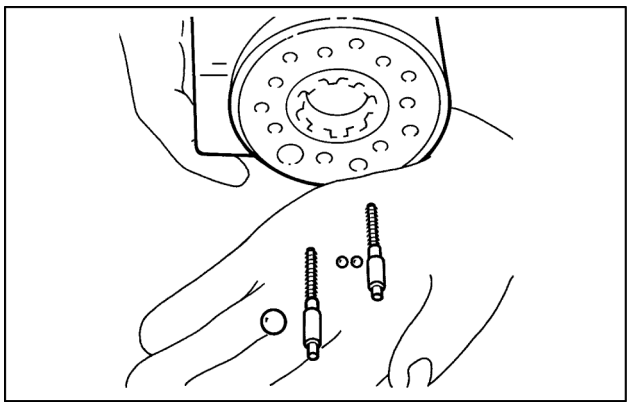
MOLI11F0741AA 6

8. Extract the O-ring seal from the control valve body.



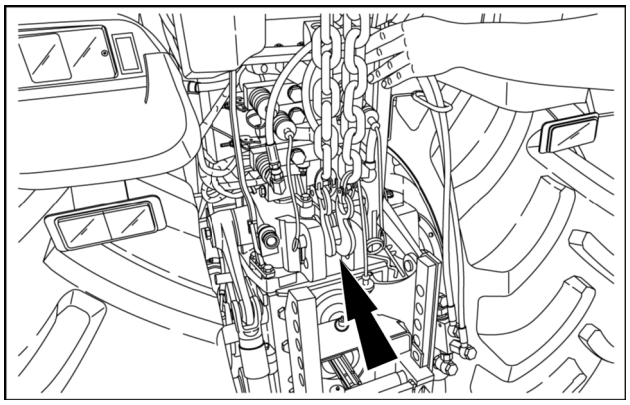
MOLI11F0742AA 7

9. Rotate the control valve body and extract the non-return valve ball, the two balls with the relative pins and the backflow valve springs.



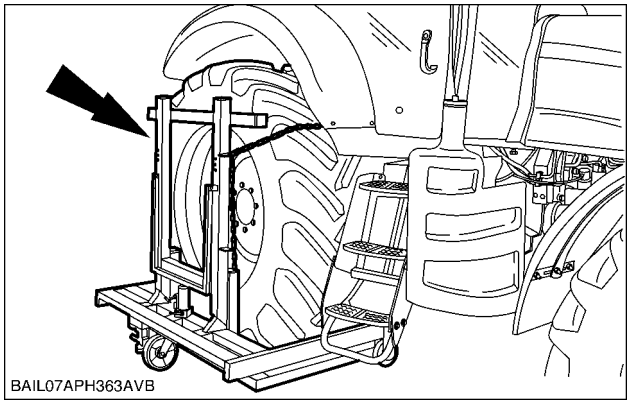
MOLI11F0743AA 8

5. Lift the rear of the vehicle using the bridge crane.



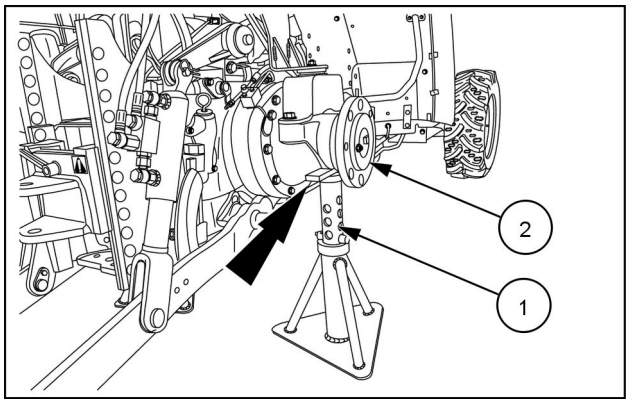
MOIL15TR03446AA 3

6. Position the equipment suitable for the wheels support and removal.
7. Using a pneumatic gun, remove the 8 fixing screws of each of the rear wheels to the related hubs.
8. Remove both rear wheels.

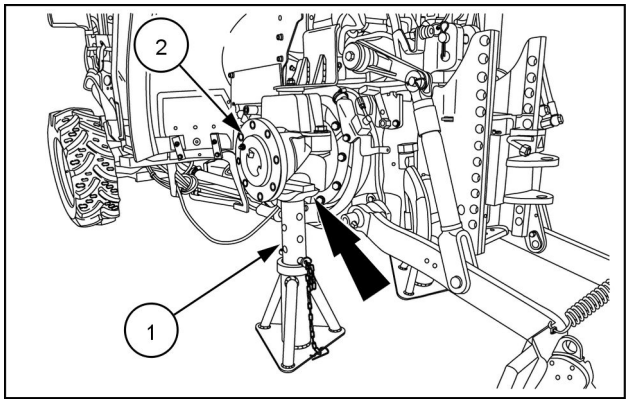


BAIL07APH363AVB 4

9. Correctly position a suitable support jack stand **(1)** from under each of the rear right-hand and left-hand final drives **(2)**.
10. Interpose a (wooden or rubber) buffer in the points indicated, between each of the rear final drives and the plate of the related jack stand on which it is placed.
11. Lower the rear of the vehicle and remove the chains or straps used for lifting.

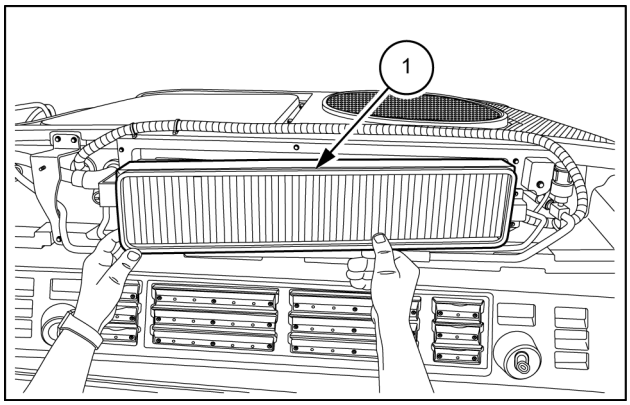


MOIL15TR03449AA 5



MOIL15TR03448AA 6

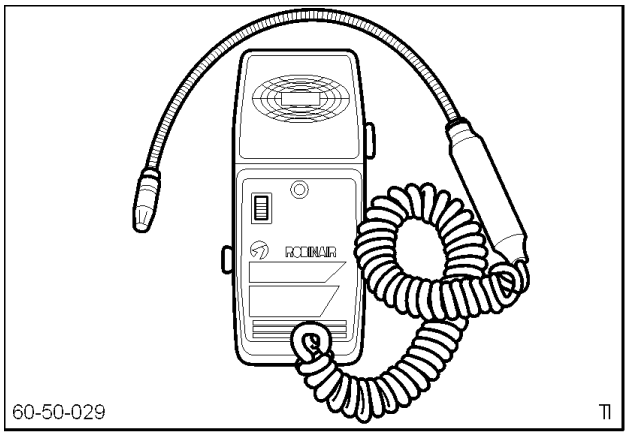
4. Remove the cab air cleaner **(1)** from its seat.



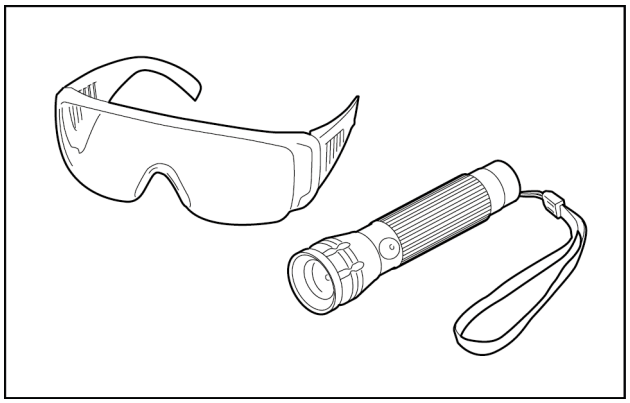
MOIL15TR02251AB 3

Air conditioning system containing refrigerant

1. Air conditioning leak detection tools:
   - To perform a leak test on an air conditioning system containing refrigerant, use an electronic leak detector, Figure **1** and follow the manufacturer's instructions.
   - Electronic leak detectors use flashing lights or sound to alert the operator to a leak. If the leak detector's sensitivity is adjustable, calibrate the detector according to the manufacturer's instructions before use.
   - When using a leak detector, consider that a very slight amount of leakage in the compressor pulley area is normal and does not necessarily indicate a repair is required.
   - Air conditioning systems can contain an ultraviolet dye that is not always visible to the naked eye and requires the use of ultraviolet goggles with an ultraviolet torch, Figure **2**.



60-50-029 1

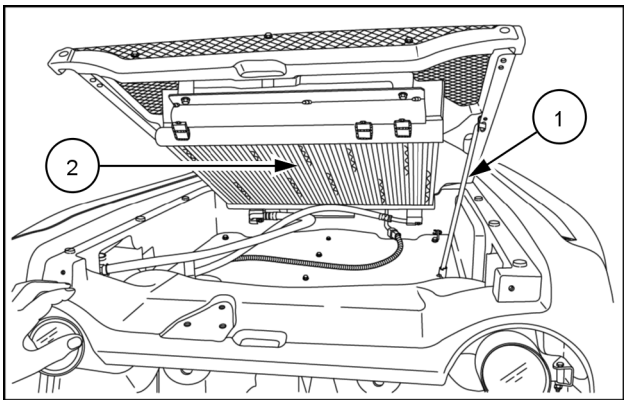


COIL15GR00995AA 2

2. Check for any air condition refrigerant leaks:
   A. Use the electronic leak detector to check:
      - The air conditioning compressor.
      - The air conditioning condenser.
      - The air conditioning pressure sensor.
      - All air conditioning hoses and pipe joints.
      - The air conditioning service valves.
      - On the cab roof (to check the evaporator).
   B. Using a pair of ultraviolet goggle with an ultraviolet torch, visually check for any dye leaking around:
      - The air conditioning compressor.
      - The air conditioning condenser.
      - The air conditioning pressure sensor.
      - All air conditioning hoses and pipe joints.
      - The air conditioning service valves.
      - The air conditioning evaporator.

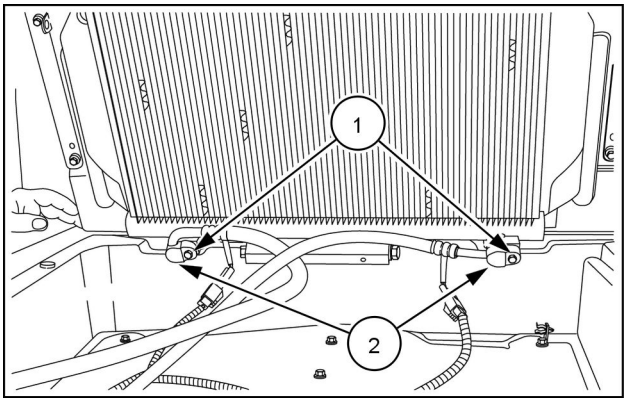
NOTE: *To pinpoint a leak, soapy water can be used on the area. A leak will be identified by bubbles escaping from the air conditioning system.*

8. Lock the access panel of the drier assembly by means of the support rod **(1)**.
9. Thoroughly clean the capacitor area **(2)**.



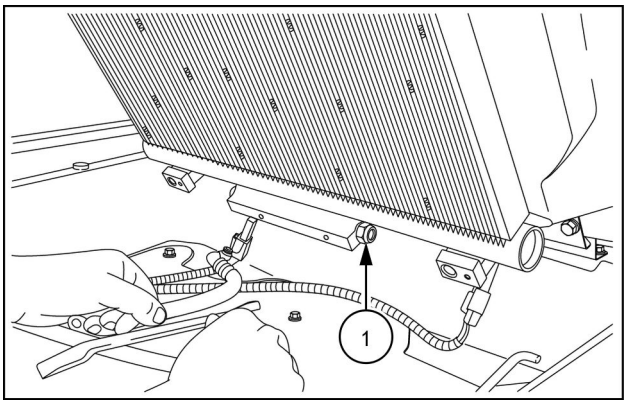
MOIL15TR03669AA 3

10. Loosen the two retaining screws **(1)**of the air conditioning system pipes coupling **(2)** on the capacitor.
11. Disconnect the air conditioning system pipes coupling **(2)** on the capacitor.



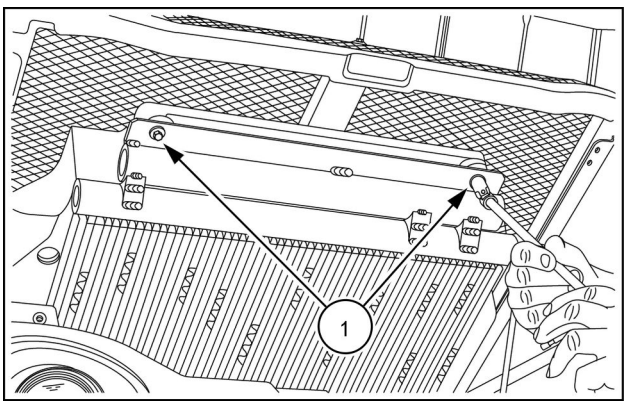
MOIL15TR03670AA 4

12. Loosen and remove the capacitor lower retaining bolt **(1)**.



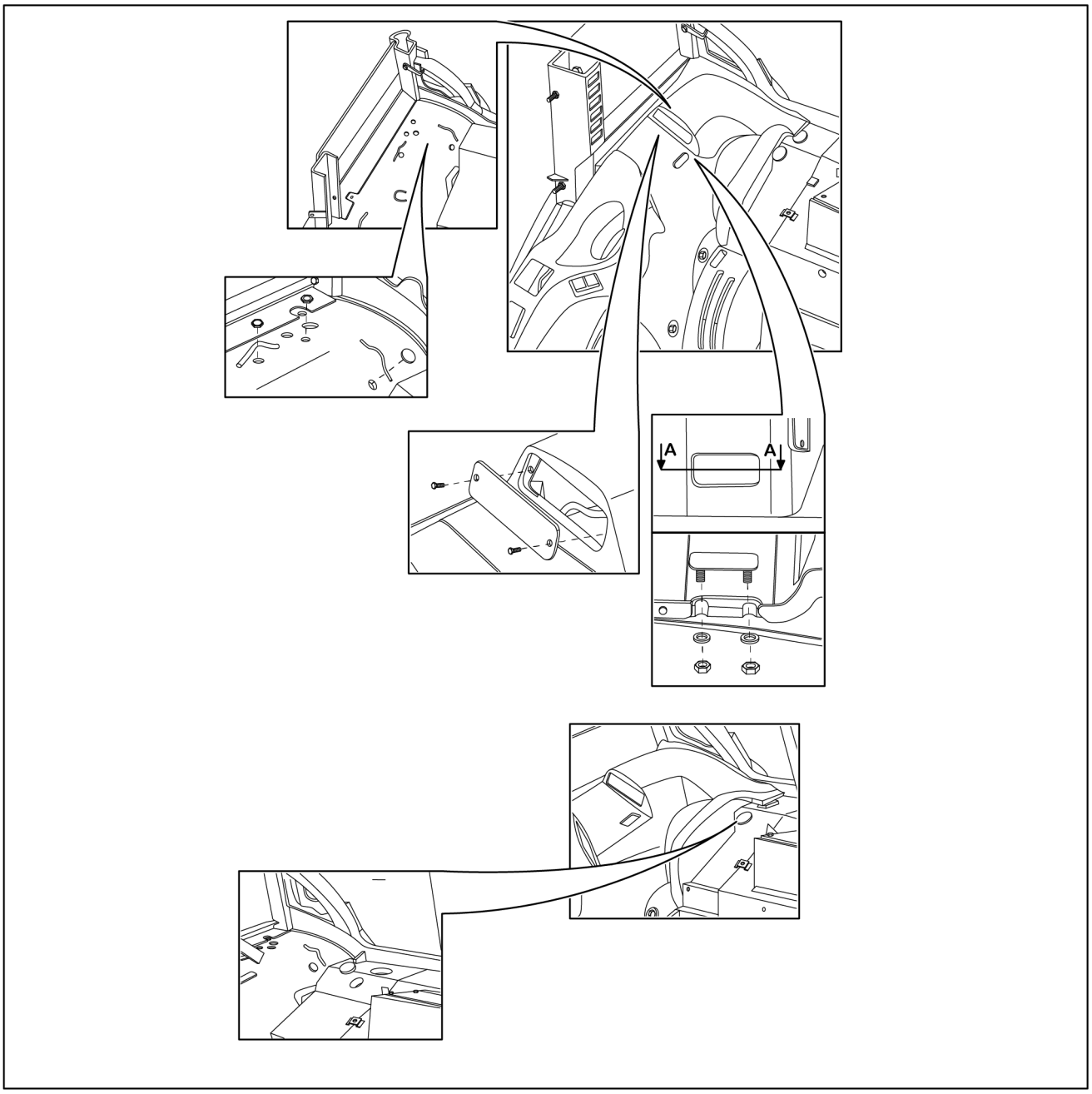
MOIL15TR03671AA 5

13. Loosen the two capacitor upper retaining screws **(1)**.
14. Remove the capacitor from its seat and put it on a suitable stand.



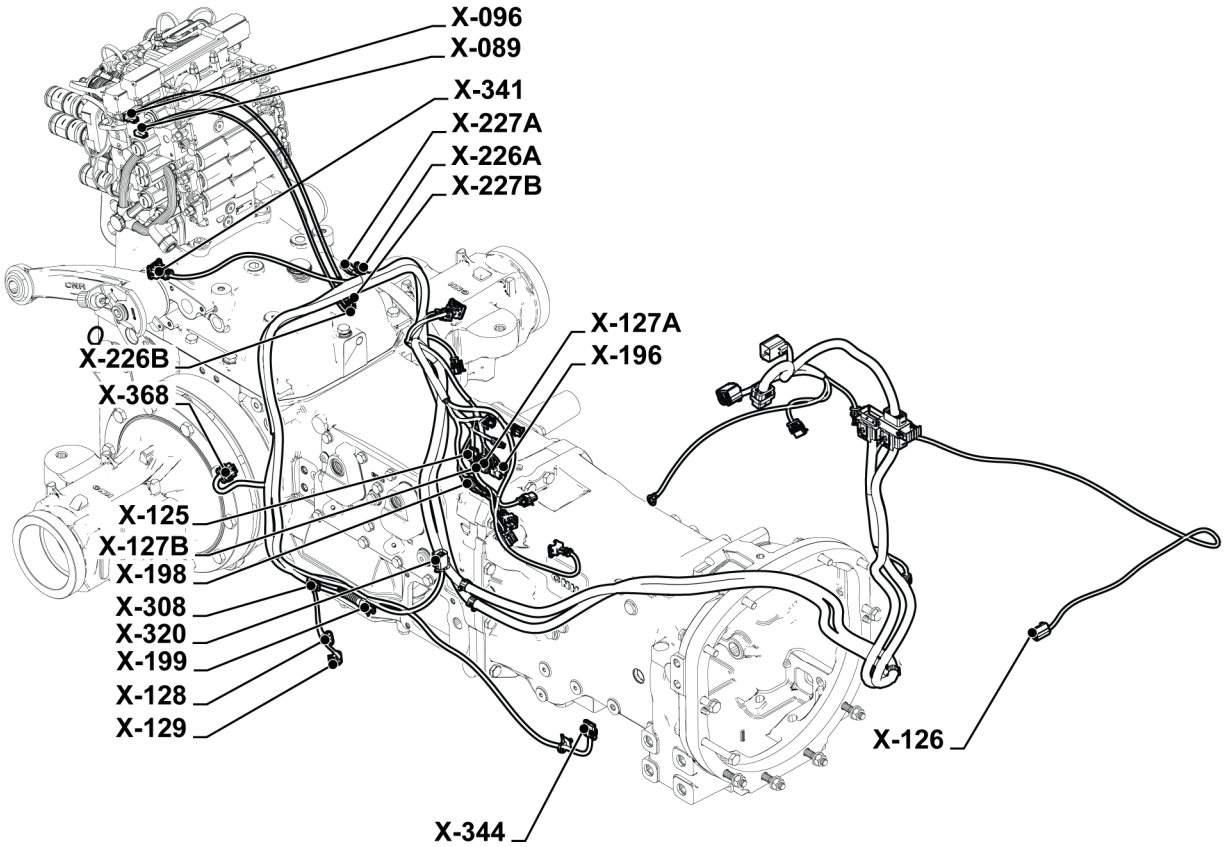
MOIL15TR03672AA 6

If the tractor is fitted with rear mechanical lift (MDC)



MOIL17TR02067GA 4

Harnesses and connectors - Component localization 06 - Hi-Lo transmission wiring, right-hand side view



MOIL17TR02008HA 1

J-013 - MMV 8A SOCKET (Power outlet)

Component Type	Power outlet
Wiring frames	**SHEET 46 SH-046_SOCKETS**
Connectors	**X-025 (Receptacle)** - 8A SOCKET [J-013] (87691950)

J-014 - MMV 8A SOCKET (Power outlet)

Component Type	Power outlet
Wiring frames	**SHEET 46 SH-046_SOCKETS**
Connectors	**X-022 (Receptacle)** - 8A SOCKET [J-014] (87691950)

Electrical components - Motor description

T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.100LP Without cab [HLRT410LTHLT07868 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.110LP Without cab [HLRT411LLHLT08186 -]	NA
T4.80F Without cab [HLRT480FKHLT07195 -]	NA
T4.80LP Without cab [HLRT480L*JLT***** -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA
T4.90LP Without cab [HLRT490LPHLT07434 -]	NA

M-001 - Starter Motor (Motor)

Component Type	Motor
Wiring frames	**SHEET 04 SH-004_POWER_DISTRIBUTION_MAIN_battery**
Connectors	**X-011 (Receptacle)** - +50 starter motor [M-001] (82944111)

M-101 - EGR (Motor)

Component Type	Motor
Wiring frames	**SHEET 23 SH-023_ENGINE 2_F5C_T4a**
Connectors	**X-964** - EGR motor [M-101]

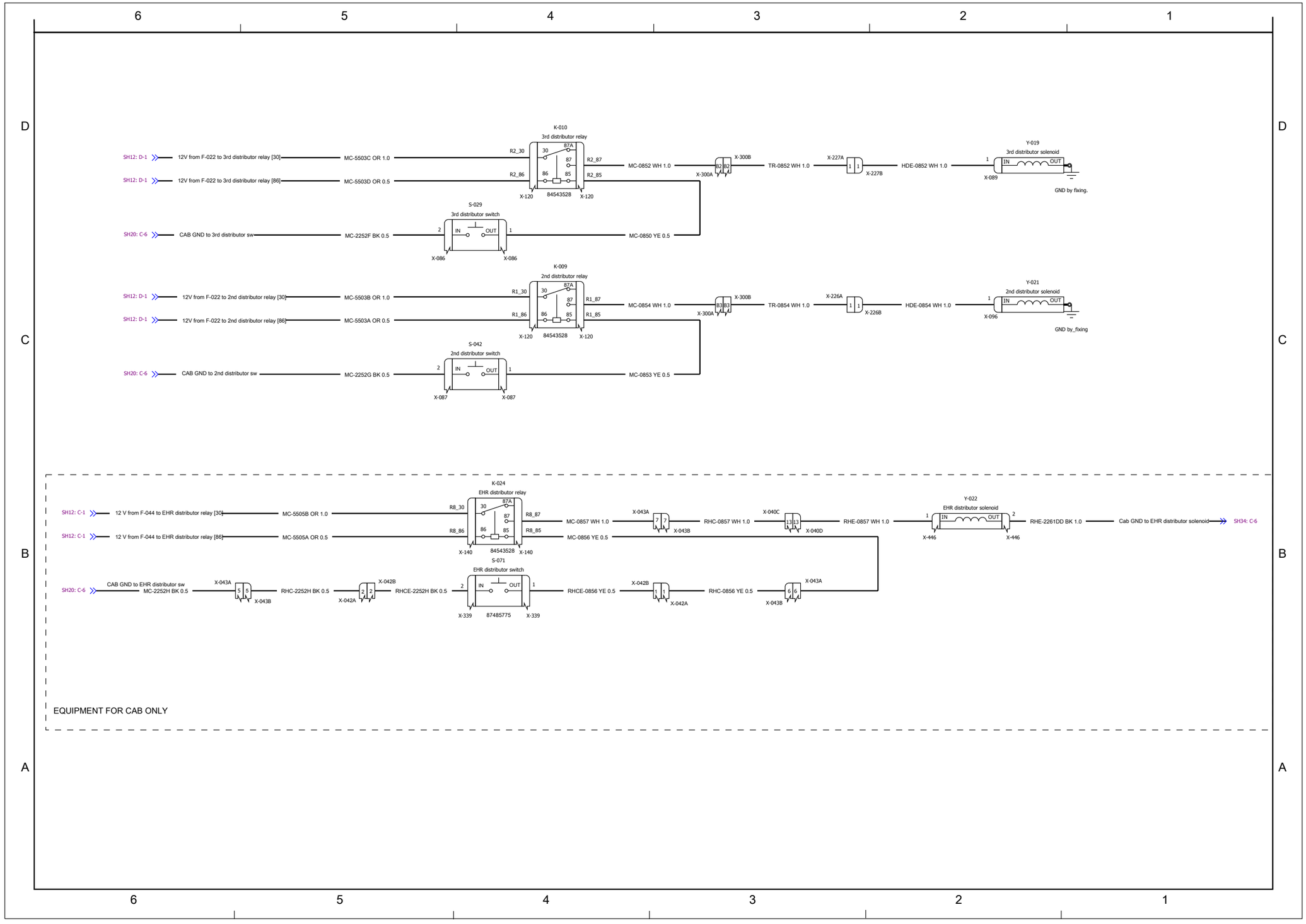
M-102 - TVA (Motor)

Component Type	Motor
Wiring frames	**SHEET 23 SH-023_ENGINE 2_F5C_T4a**
Connectors	**X-966** - TVA solenoid valve [M-102]

Wiring harnesses - Electrical schematic sheet 14 SH-014_POWER_DIS-TRIBUTION_power_socket

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Type	Component	Connector / Link
Fuse	**F-003** - 8A SOCKET CAB (Fuse)	
Fuse	**F-003#** - BEACON/CIGAR/ ROOF LAMP (Fuse)	
Fuse	**F-032** - 25/40A ISO/NAR (Fuse)	
Fuse	**F-034** - DIAG SOCKET (Fuse)	
Fuse	**F-041** - 8A SOCKET CAB (Fuse)	
Fuse	**F-045** - ABS SOCKET (Fuse)	**X-170** - ABS SOCKET FUSE [F-045] (84175724)
Connector	X-043A	**X-043A** - Cab-EHR harness (87747425)
Connector	X-043B	**X-043B** - EHR-cab harness (87736500)
Connector	X-081A	**X-081A** - Cab-socket harness (84131052)
Connector	X-081B	**X-081B** - Socket-cab harness (84163393)
Connector	X-110	**X-110** - Fuse Relay Module R1-R8 - F33-F [F-035] (87314762)
Connector	X-130	**X-130** - Fuse Relay Module F1-F32 [F-001] (87314761)
Connector	X-140	**X-140** - Fuse Relay Module R17-R24 - F41 [F-044] (87314762)
Connector	X-150	**X-150** - Fuse and Relay module - ROOF [F-007#] (84529039)
Connector	X-170	**X-170** - ABS SOCKET FUSE [F-045] (84175724)

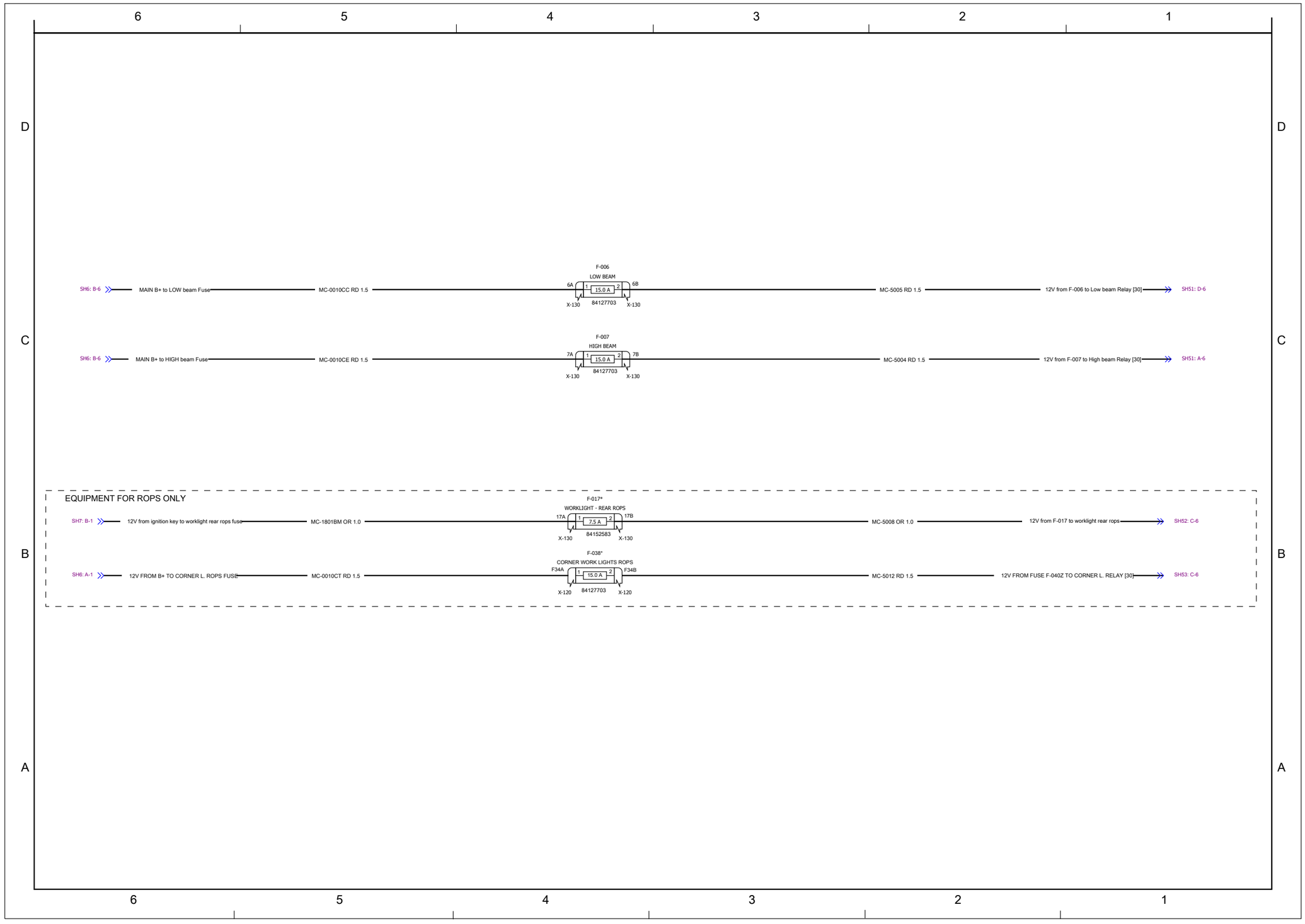

6
5
4
3
2
1
D
C
B
A
K-010
3rd distributor relay
SH12: D-1
12V from F-022 to 3rd distributor relay [30]
MC-5503C OR 1.0
R2_30
30
87A
87
R2_87
MC-0852 WH 1.0
X-300B
TR-0852 WH 1.0
X-227A
HDE-0852 WH 1.0
Y-019
3rd distributor solenoid
IN
OUT
X-089
GND by fixing.
SH12: D-1
12V from F-022 to 3rd distributor relay [86]
MC-5503D OR 0.5
R2_86
86
85
R2_85
X-120
84543528
X-120
S-029
3rd distributor switch
SH20: C-6
CAB GND to 3rd distributor sw
MC-2252F BK 0.5
IN
OUT
MC-0850 YE 0.5
X-086
X-086
K-009
2nd distributor relay
SH12: D-1
12V from F-022 to 2nd distributor relay [30]
MC-5503B OR 1.0
R1_30
R1_87
MC-0854 WH 1.0
X-300B
TR-0854 WH 1.0
X-226A
HDE-0854 WH 1.0
Y-021
2nd distributor solenoid
GND by_fixing
X-096
SH12: D-1
12V from F-022 to 2nd distributor relay [86]
MC-5503A OR 0.5
R1_86
R1_85
X-120
84543528
X-120
S-042
2nd distributor switch
SH20: C-6
CAB GND to 2nd distributor sw
MC-2252G BK 0.5
MC-0853 YE 0.5
X-087
X-087
K-024
EHR distributor relay
SH12: C-1
12 V from F-044 to EHR distributor relay [30]
MC-5505B OR 1.0
R8_30
R8_87
MC-0857 WH 1.0
X-043A
RHC-0857 WH 1.0
X-040C
RHE-0857 WH 1.0
Y-022
EHR distributor solenoid
RHE-2261DD BK 1.0
Cab GND to EHR distributor solenoid
SH34: C-6
X-446
X-446
SH12: C-1
12 V from F-044 to EHR distributor relay [86]
MC-5505A OR 0.5
R8_86
R8_85
MC-0856 YE 0.5
X-140
84543528
X-140
S-071
EHR distributor switch
SH20: C-6
CAB GND to EHR distributor sw
MC-2252H BK 0.5
X-043A
X-043B
RHC-2252H BK 0.5
X-042B
X-042A
RHCE-2252H BK 0.5
IN
OUT
X-339
87485775
X-339
RHCE-0856 YE 0.5
X-042B
X-042A
RHC-0856 YE 0.5
X-043A
X-043B
EQUIPMENT FOR CAB ONLY

SHT_32 1

Wiring harnesses - Electrical schematic sheet 52 SH-052_LIGHTS_work

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Type	Component	Connector / Link
ECU	**A-005** - ADIC LOW LINE (ECU)	**X-450** - ADIC LOW LINE CN1 [A-005] (82028493)
Lamp	**E-024a** - ROOF WORKLAMP FRONT RH (Lamp)	**X-068A** - ROOF WORKLAMP FRONT RH [E-024a] (82012083)
Lamp	**E-026a** - ROOF WORKLAMP FRONT LH (Lamp)	**X-069A** - ROOF WORKLAMP FRONT LH [E-026a] (82012083)
Lamp	**E-028a** - ROOF WORKLAMP REAR RH (Lamp)	**X-055A** - ROOF WORKLAMP REAR RH [E-028a] (82012083)
Lamp	**E-030a** - ROOF WORKLAMP REAR LH (Lamp)	**X-056A** - ROOF WORKLAMP REAR LH - EXT [E-030a] (82012083)
Relay	**K-001#** - WORKLIGHT-REAR (Relay)	
Relay	**K-004#** - WORKLIGHT-FRONT (Relay)	
Switch	**S-052** - WORKLIGHT SWITCH (Switch)	**X-065** - Worklight sw connection [S-052] (87745329) **X-065L** - Worklight sw lamp connection [S-052] (84131048)
Connector	X-050A	**X-050A** - CAB-ROOF inline 1 (87736477)
Connector	X-050B	**X-050B** - CAB-ROOF inline 1 (87736504)
Connector	X-055A	**X-055A** - ROOF WORKLAMP REAR RH [E-028a] (82012083)
Connector	X-056A	**X-056A** - ROOF WORKLAMP REAR LH - EXT [E-030a] (82012083)
Connector	X-065	**X-065** - Worklight sw connection [S-052] (87745329)
Connector	X-065L	**X-065L** - Worklight sw lamp connection [S-052] (84131048)
Connector	X-068A	**X-068A** - ROOF WORKLAMP FRONT RH [E-024a] (82012083)
Connector	X-069A	**X-069A** - ROOF WORKLAMP FRONT LH [E-026a] (82012083)
Connector	X-150	**X-150** - Fuse and Relay module - ROOF [F-007#] (84529039)
Connector	X-460	**X-460** - ADIC LL - CN2 (82016219)


6
5
4
3
2
1
D
C
B
A
SH6: B-6
MAIN B+ to LOW beam Fuse
MC-0010CC RD 1.5
F-006
LOW BEAM
6A
1
15.0 A
2
6B
X-130
84127703
X-130
MC-5005 RD 1.5
12V from F-006 to Low beam Relay [30]
SH51: D-6
SH6: B-6
MAIN B+ to HIGH beam Fuse
MC-0010CE RD 1.5
F-007
HIGH BEAM
7A
1
15.0 A
2
7B
X-130
84127703
X-130
MC-5004 RD 1.5
12V from F-007 to High beam Relay [30]
SH51: A-6
EQUIPMENT FOR ROPS ONLY
SH7: B-1
12V from ignition key to worklight rear rops fuse
MC-1801BM OR 1.0
F-017*
WORKLIGHT - REAR ROPS
17A
1
7.5 A
2
17B
X-130
84152583
X-130
MC-5008 OR 1.0
12V from F-017 to worklight rear rops
SH52: C-6
SH6: A-1
12V FROM B+ TO CORNER L. ROPS FUSE
MC-0010CT RD 1.5
F-038*
CORNER WORK LIGHTS ROPS
F34A
1
15.0 A
2
F34B
X-120
84127703
X-120
MC-5012 RD 1.5
12V FROM FUSE F-040Z TO CORNER L. RELAY [30]
SH53: C-6

SHT_18 1

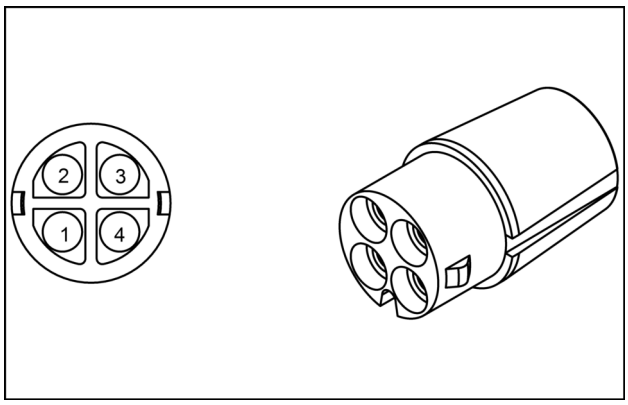
Wiring harnesses - Electrical schematic sheet 48 SH-048_ACUSTIC_device

T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.100LP Without cab [HLRT410LTHLT07868 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.110LP Without cab [HLRT411LLHLT08186 -]	NA
T4.80F Without cab [HLRT480FKHLT07195 -]	NA
T4.80LP Without cab [HLRT480L*JLT***** -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA
T4.90LP Without cab [HLRT490LPHLT07434 -]	NA

Type	Component	Connector / Link
Speaker	**H-001** - Horn (Speaker)	**X-016** - Horn negative [H-001] (87702238) **X-015** - Horn positive [H-001] (87702238)
Switch	**S-027** - MAIN TURN/LIGHTS SW (Switch)	**X-034** - Turn and lights sw [S-027] (87747425)
Connector	X-015	**X-015** - Horn positive [H-001] (87702238)
Connector	X-016	**X-016** - Horn negative [H-001] (87702238)
Connector	X-025A	**X-025A** - Cab - front lights inline (87710588)
Connector	X-025B	**X-025B** - Front lights - cab inline (87691968)
Connector	X-034	**X-034** - Turn and lights sw [S-027] (87747425)

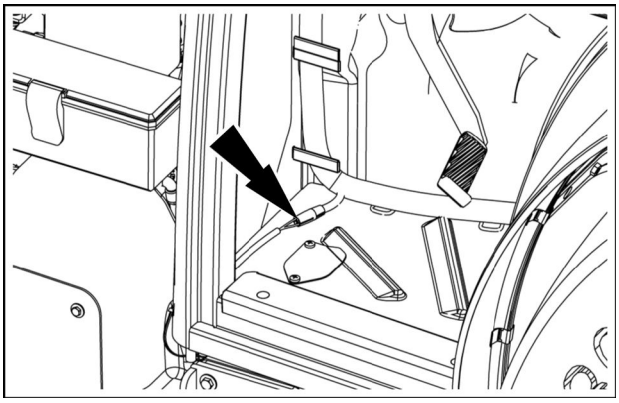
Pin	From	Wire	Description	Color-Size	Frame
A	HE-SP-0201-P-X	HE-0201D	Low beam	VT - 1.0	**SHEET 50 SH-050_LIGHTS_directions**
B	HE-SP-2250M-P-X	HE-2250ME	CAB GND to head lights LH CHI [3]	BK - 1.0	
C	HE-SP-0205-P-X	HE-0205D	High beam	VT - 1.0	

X-021A - POSITION and DIRECTION LIGHT - F (82000579) (Receptacle)



82000579 4

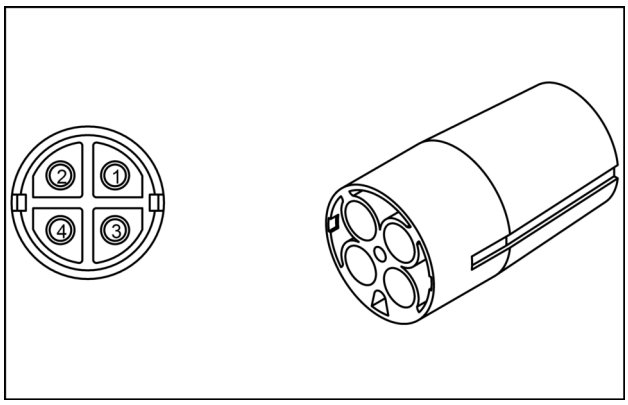
82000579



MOIL16TR00369AA 5

Pin	From	Wire	Description	Color-Size	Frame
1	SH50: C-1-P-PIN1	MC-0359B	TURN INDICATOR LH	GY - 1.0	**SHEET 50 SH-050_LIGHTS_directions**
4	MC-SP-0351B-P-X	MC-0351BA	TURN LH signal	LB - 1.0	

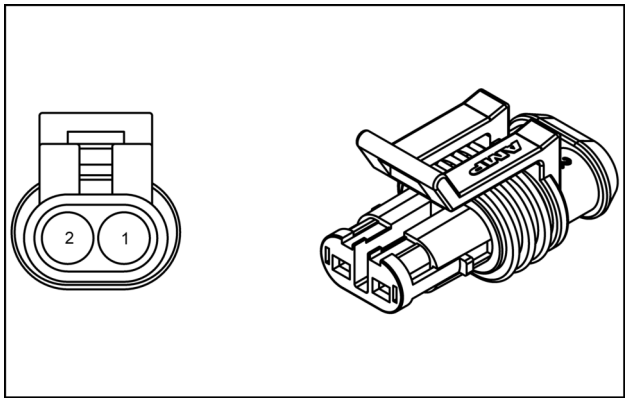
X-021B - POSITION and DIRECTION LIGHT - F (82000578) (Plug)



82000578 6

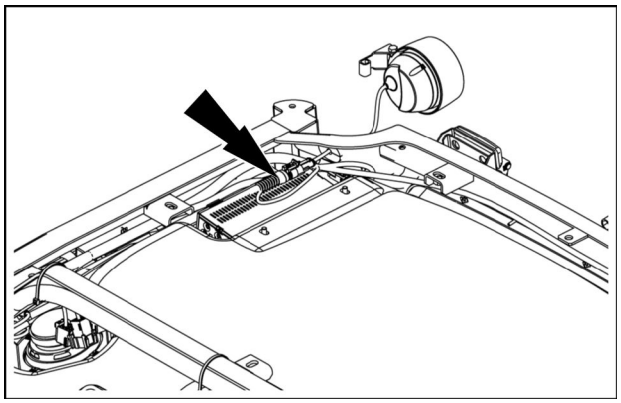
82000578

X-055A - ROOF WORKLAMP REAR RH [E-028a] (82012083) (Receptacle)



82012083 17

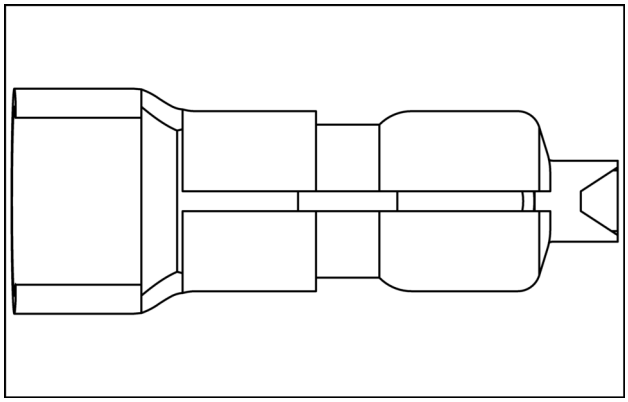
82012083



MOIL16TR00317AA 18

Pin	From	Wire	Description	Color-Size	Frame
1	MR-SP-0303-P-X	MR-0303A	WORKLIGHTS REAR	VT - 1.0	**SHEET 52 SH-052_LIGHTS_work**
2		MR-2271	ROOF GND to WL REAR RH [2]	BK - 1.0	

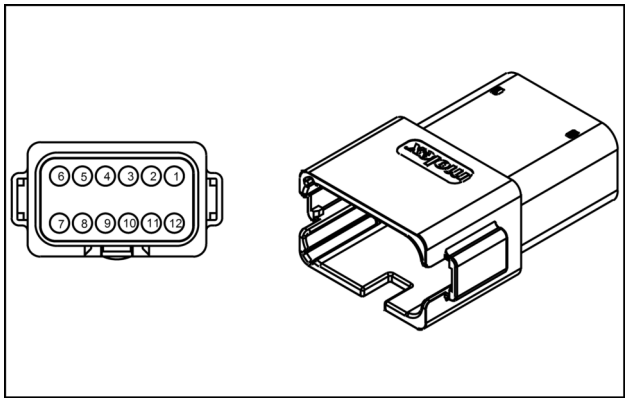
X-056 - Rear worklamp connection [E-056] (84153391) (Plug)



84153391 19

84153391

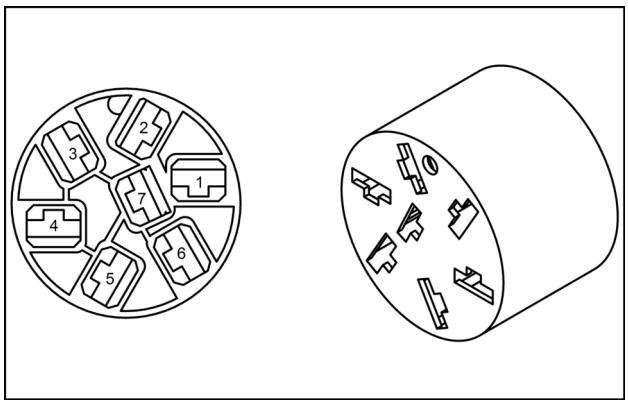
X-098DZ - SOCKET - ROPS CONNECTION (47953233) (Receptacle)



47953233 35

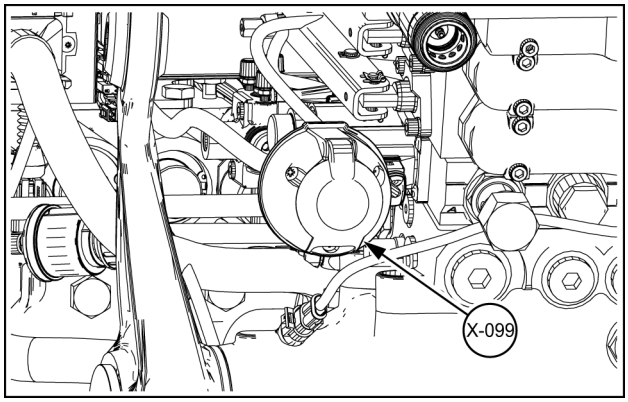
47953233

X-099A - 7 PIN SOCKET TRAILER LIGHTS ISO [J-001] (84185564) (Receptacle)



84185564 36

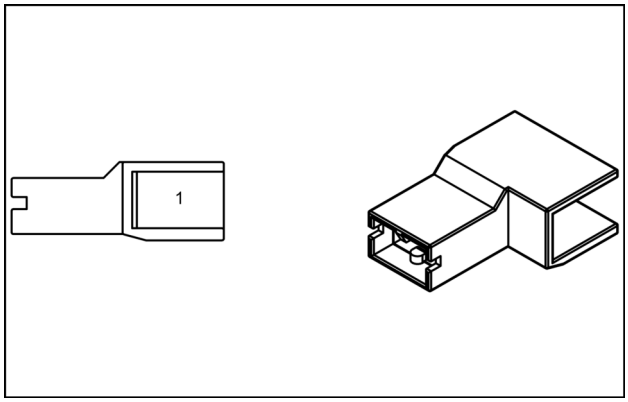
84185564



MOIL13TR00112AA 37

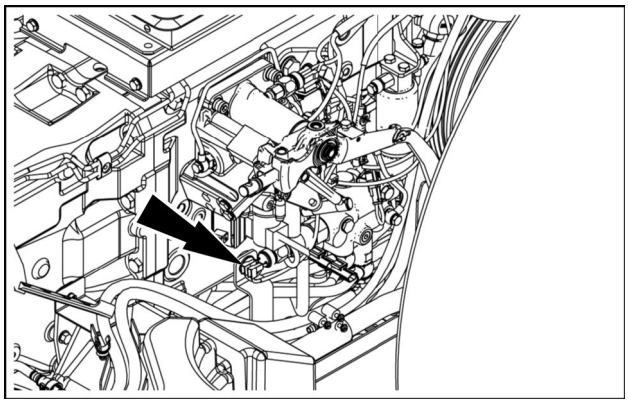
Pin	From	Wire	Description	Color-Size	Frame
1	**X-098B (Plug) pin 1** - Trailer lights - Cab inline (87736500)	TE-0353	Direction Light LH to 7 pole sk rear	YE - 1.0	**SHEET 54 SH-054_LIGHTS_trailer_iso**
3	**X-098B (Plug) pin 2** - Trailer lights - Cab inline (87736500)	TE-2254	TRAILER LIGHTS GND	WH - 1.5	
4	**X-098B (Plug) pin 3** - Trailer lights - Cab inline (87736500)	TE-0354	Direction Light RH to 7 pole sk rear	GN - 1.0	
5	**X-098B (Plug) pin 4** - Trailer lights - Cab inline (87736500)	TE-5003AC	Position Light to 7 pole sk rear	BR - 1.5	
6	**X-098B (Plug) pin 5** - Trailer lights - Cab inline (87736500)	TE-0402C	TRAILER LIGHTS STOP	RD - 1.0	
7	**X-098B (Plug) pin 6** - Trailer lights - Cab inline (87736500)	TE-0253	Position Light to 7 pole sk rear	BK - 1.5	

X-196Z - power-off SW [S-014] (82944111) (Receptacle)



82944111 12

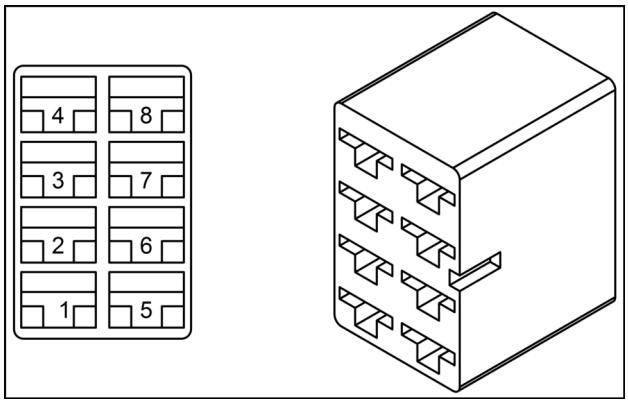
82944111



MOIL16TR00122AA 13

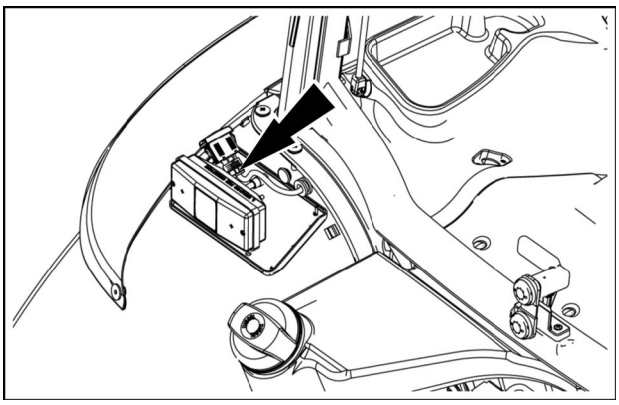
Pin	From	Wire	Description	Color-Size	Frame
1	**X-300B (Plug) pin C8** - Trasnmissison-cab inline (87714265)	TR-1101	Power off signal	YE - 1.0	**SHEET 26 SH-026_TRANSMISSION_CONTROL_sensors_actuators_PS**

X-197 - BDS [S-015] (87745329) (Receptacle)

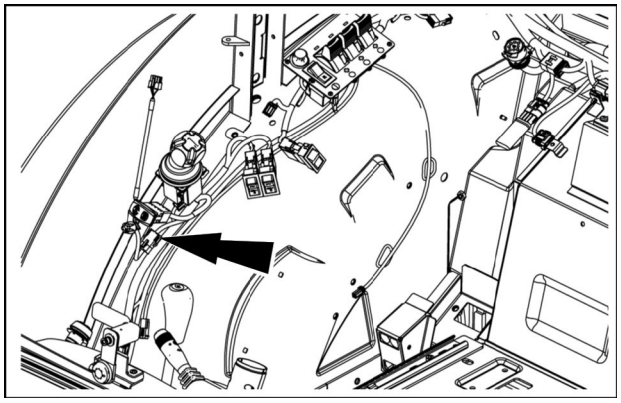


87745329 14

87745329



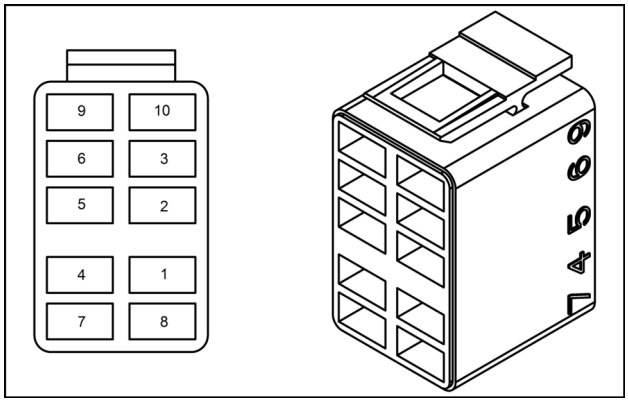
MOIL16TR00360AA 18



MOIL16TR00214AA 12

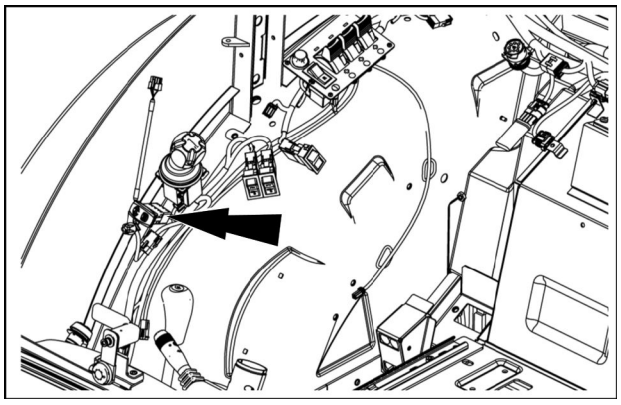
Pin	From	Wire	Description	Color-Size	Frame
1	**X-384 (Receptacle) pin 7** - MMV 60-80lt [A-004] (87706495)	MMC-0871	Motor function input	YE - 0.5	**SHEET 35 SH-035_MMV_80/ 64Rlt_commands**

X-387 - Motor mode sw connection [S-040] (87426885) (Receptacle)



87426885 13

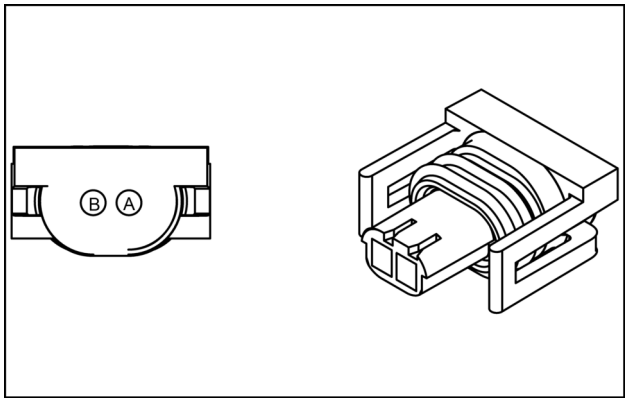
87426885



MOIL16TR00215AA 14

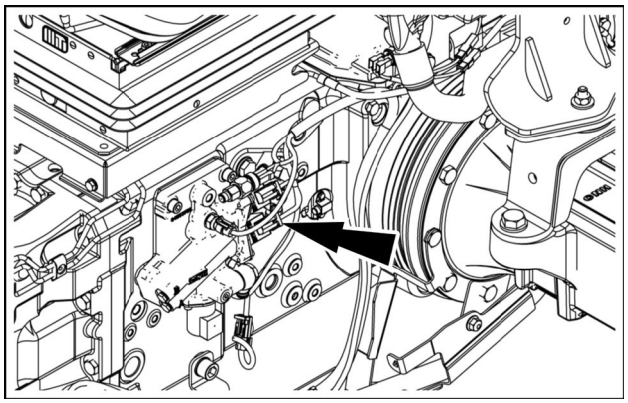
Pin	From	Wire	Description	Color-Size	Frame
1	**X-384 (Receptacle) pin 9** - MMV 60-80lt [A-004] (87706495)	MMC-0873	Motor mode on	YE - 0.5	**SHEET 35 SH-035_MMV_80/ 64Rlt_commands**
6	**X-384 (Receptacle) pin 26** - MMV 60-80lt [A-004] (87706495)	MMC-0872	Motor mode off	YE - 0.5	
10	SH35: B-6-P-PIN1	MMC-5003ACA	Backlighting motor mode sw	VT - 0.5	

X-807 - clutch B HI solenoid [Y-007] (87692812) (Receptacle)



87692812 3

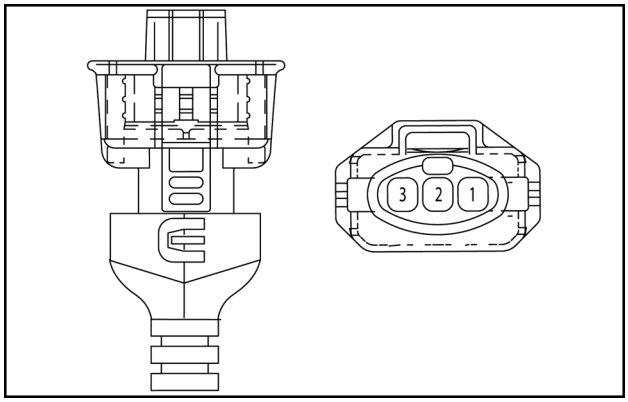
87692812



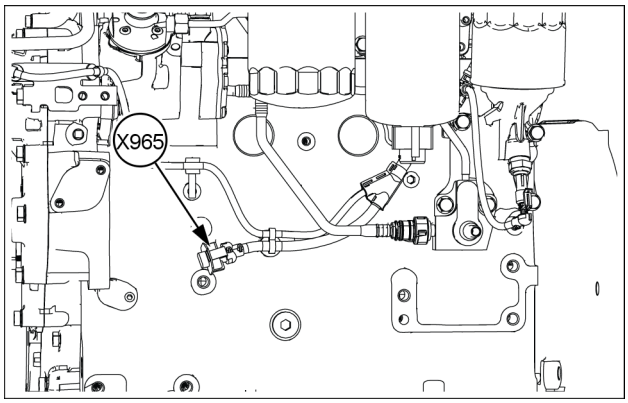
MOIL16TR00281AA 4

Pin	From	Wire	Description	Color-Size	Frame
A	**X-700D (Plug) pin A8** - PS transmission-cab inline (87714273)	PST-1121*	HI clutch solenoid	GY - 1.0	**SHEET 26 SH-026_TRANSMISSION_CONTROL_sensors_actuators_PS**
A	**X-700B (Plug) pin A8** - HI-LO transmission-cab inline (87714273)	PST-1121	HI clutch solenoid	GY - 1.0	
B	**X-700D (Plug) pin A5** - PS transmission-cab inline (87714273)	PST-1122*	HI clutch solenoid	WH - 1.0	
B	**X-700B (Plug) pin A5** - HI-LO transmission-cab inline (87714273)	PST-1122	HI clutch solenoid	WH - 1.0	

X-965 Increment speed sensor [B-106]



X-965OK 11



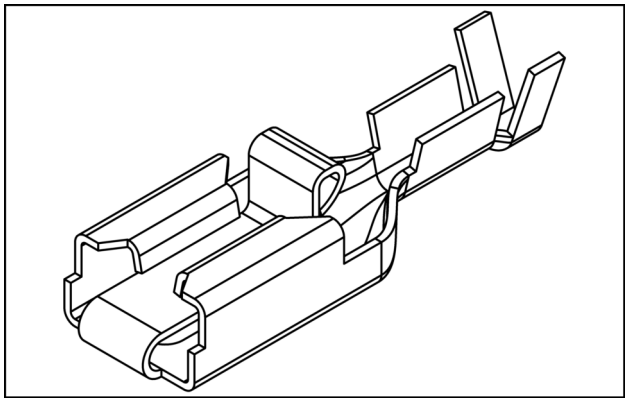
MOIL18TR01534AA 12

Pin	From	Description	Wire Size	frame
1	**X-941A (Female) pin 9**	**A-010 X-939 (Female) pin 59** Crankshaft speed +	0.75H	**Wiring harnesses - Electrical schematic sheet 23 (55.100)**
2	**X-941A (Female) pin 10**	**A-010 X-939 (Female) pin 44** Crankshaft speed –	0.75H	

Wire connectors - Component diagram 07

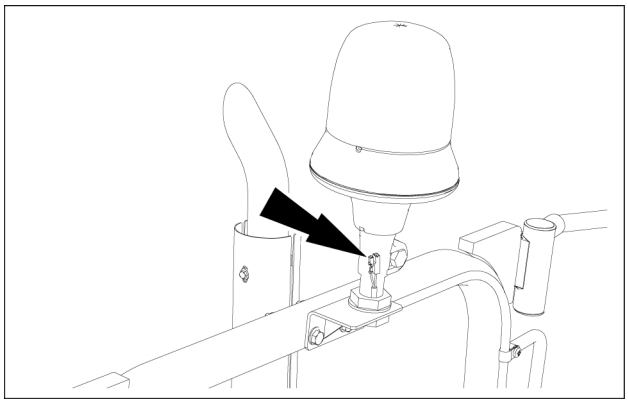
T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.100LP Without cab [HLRT410LTHLT07868 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.110LP Without cab [HLRT411LLHLT08186 -]	NA
T4.80F Without cab [HLRT480FKHLT07195 -]	NA
T4.80LP Without cab [HLRT480L*JLT***** -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA
T4.90LP Without cab [HLRT490LPHLT07434 -]	NA

X-070 - BEACON light connection [E-033] (87680217) (Plug)



87680217 1

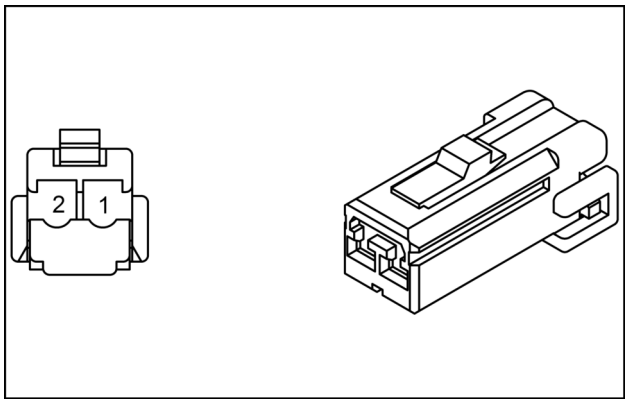
87680217



MOIL17TR03546AA 2

Pin	From	Wire	Description	Color-Size	Frame
1	**X-072B (Plug) pin 2** - Beacon - rops inline (87679493)	BJ-2261E*	BEACON light GND	BK - 1.0	**SHEET 49 SH-049_LIGHTS_position_license_beacon_spot**

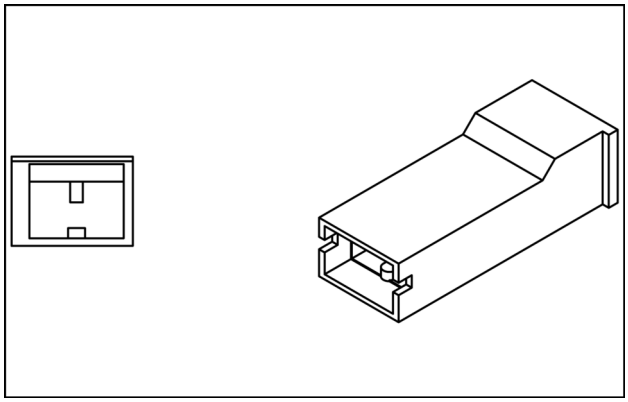
X-072A - Rops - beacon inline (87736475) (Receptacle)



87736475 3

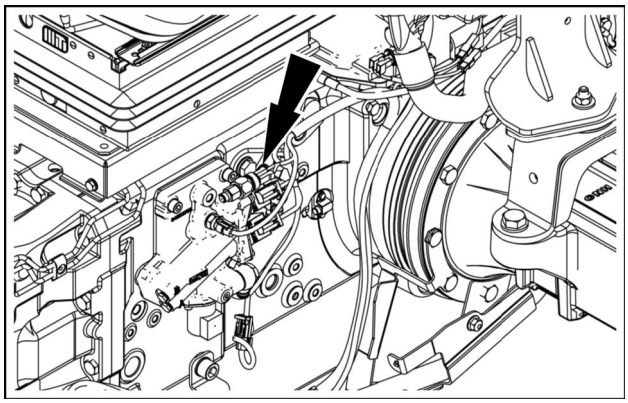
87736475

X-183 - Trans oil pressure sw [B-005] (87702238) (Receptacle)



87702238 7

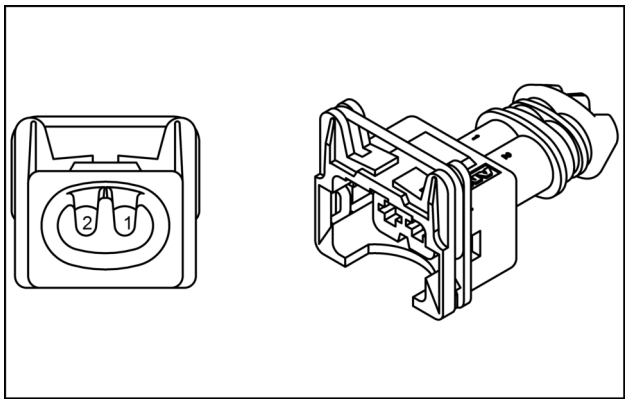
87702238



MOIL16TR00116AA 8

Pin	From	Wire	Description	Color-Size	Frame
1	**X-700D (Plug) pin B4** - PS transmission-cab inline (87714273)	PST-1108	Transmission oil pressure signal	YE - 1.0	**SHEET 26 SH-026_TRANSMISSION_CONTROL_sensors_actuators_PS**

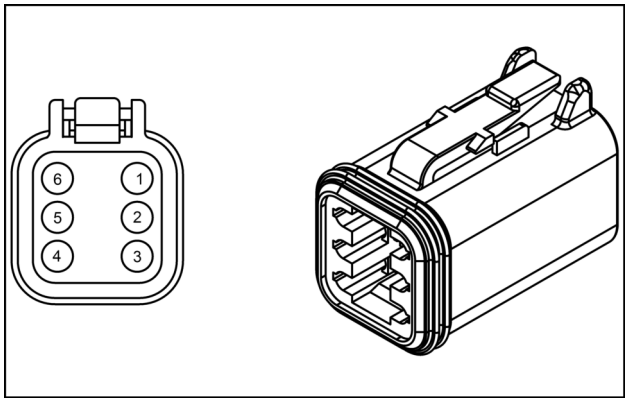
X-186 - HI-LO MODE SOLENOID [Y-004] (87694651) (Receptacle)



87694651 9

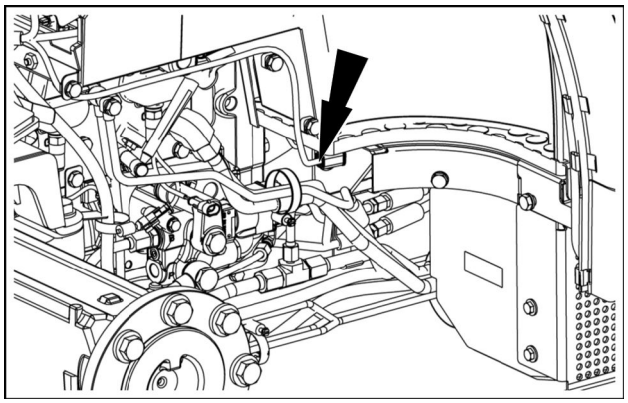
87694651

X-321 - Electronic foot throttle [B-014] (87597749) (Receptacle)



87597749 3

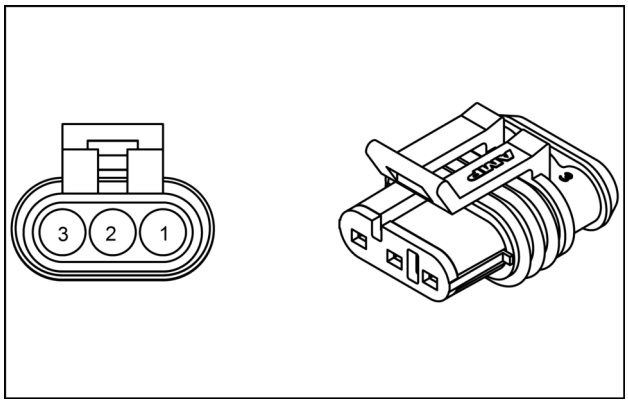
87597749



MOIL16TR00154AA 4

Pin	From	Wire	Description	Color-Size	Frame
3	**X-450 (Receptacle) pin 5** - ADIC LOW LINE CN1 (82028493)	MC-0194	Foot throttle ss	YE - 0.5	**SHEET 24 SH-024_ENGINE 3_F5C_T4a**
6	**X-450 (Receptacle) pin 7** - ADIC LOW LINE CN1 (82028493)	MC-0195	Foot throttle sw	YE - 0.5	

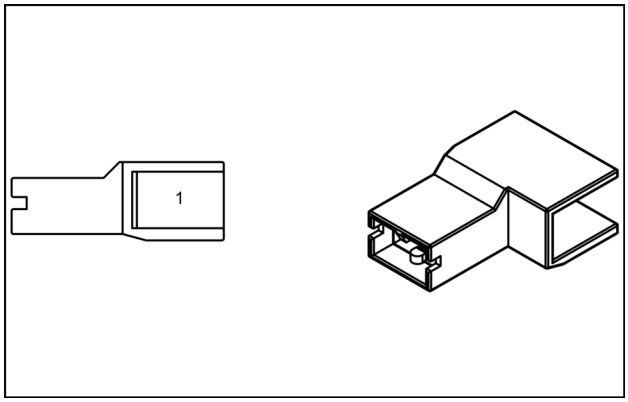
X-322 - Clutch pedal potentiometer [B-011] (84062580) (Receptacle)



84062580 5

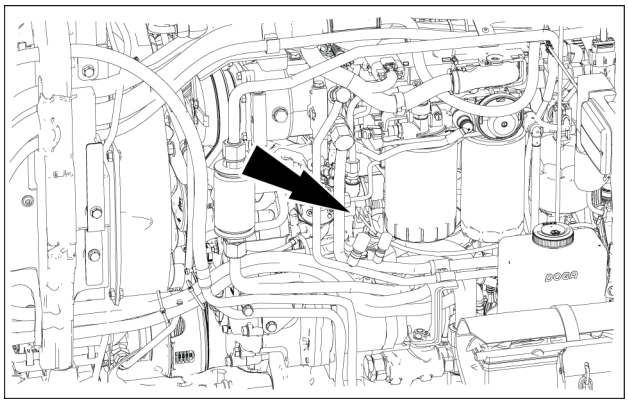
84062580

X-503 - IT Hyd trailer brake safety sw [S-016] (82944111) (Receptacle)



82944111 7

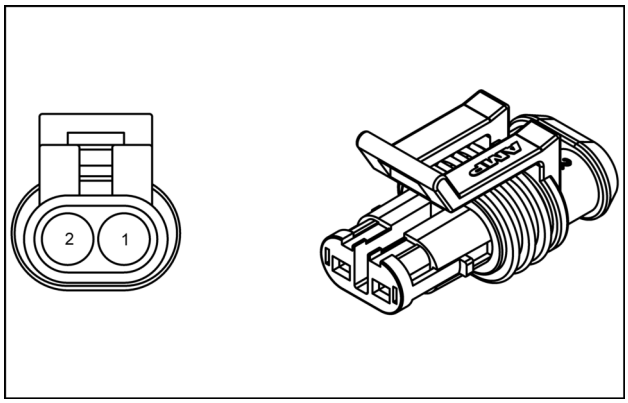
82944111



MOIL17TR03551AA 8

Pin	From	Wire	Description	Color-Size	Frame
1	**X-381B (Plug) pin 4** - Hyd trailer inline - Cab (84164980)	TRB-0602	IT hyd trailer brake low pressure signal	YE - 1.0	**SHEET 40 SH-040_TRAILER_italian_hydraulic_brake**

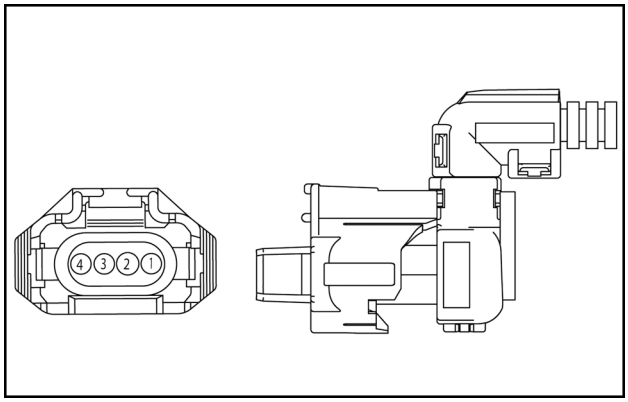
X-504 - Creeper sw [S-003] (82012083) (Receptacle)



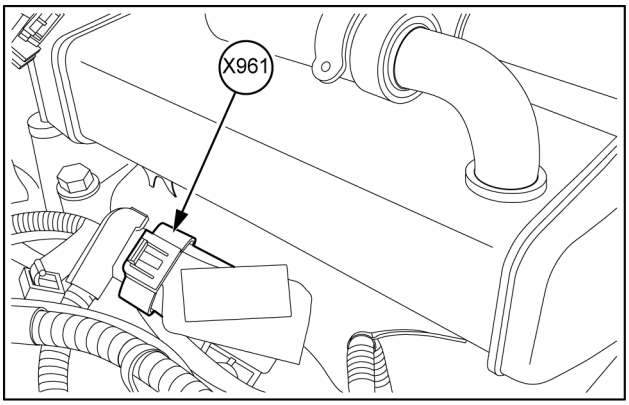
82012083 9

82012083

X-961 Air pressure/temperature sensor [B-101]



X-961OK 3



MOIL12TR0521AA 4

Pin	From	Description	Wire Size	frame
1	**X-941A (Female) pin 19**	**A-010 X-939 (Female) pin 25** Boost pressure sensor signal	0.50H	**Wiring harnesses - Electrical schematic sheet 23 (55.100)**
2	**X-941A (Female) pin 20**	**A-010 X-939 (Female) pin 55** Boost pressure sensor temperature	0.50H	
3	**X-941A (Female) pin 17**	**A-010 X-939 (Female) pin 10** Boost pressure sensor supply	0.50H	
4	**X-941A (Female) pin 18**	**A-010 X-939 (Female) pin 40** Boost pressure sensor ground	0.50H	

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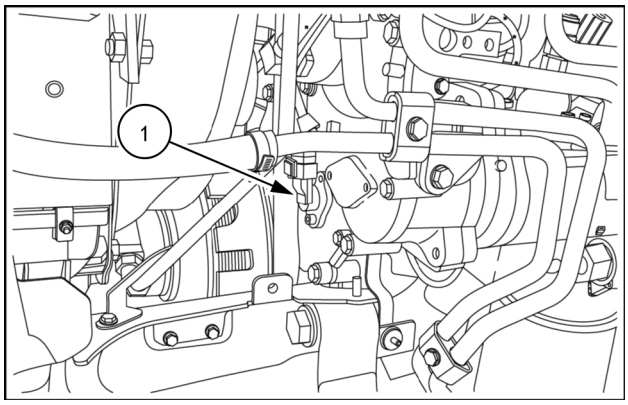
(*) See content for specific models

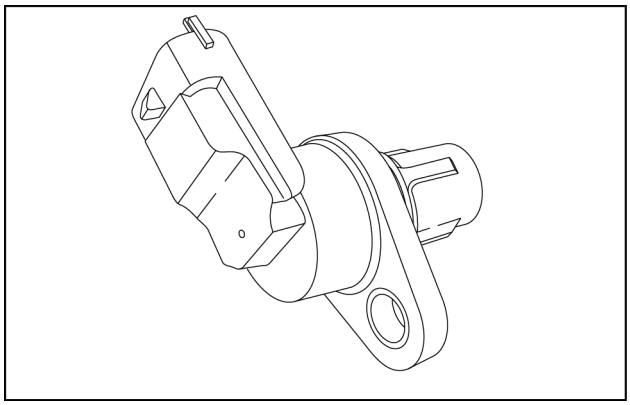
Engine timing sensors - Install - Camshaft sensor

1. Thoroughly clean the engine camshaft sensor seat area **(1)**.



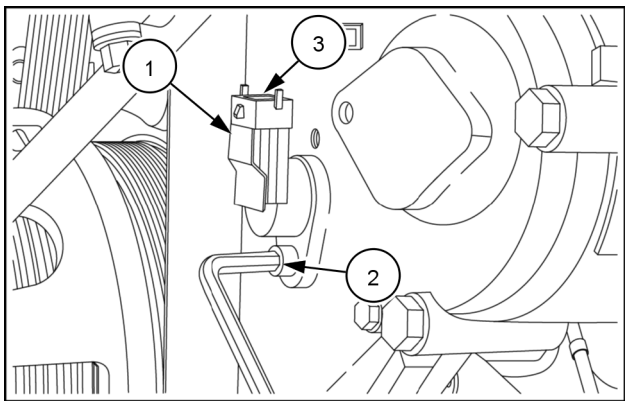
MOIL15TR03677AA 1

2. Recover the engine camshaft sensor.



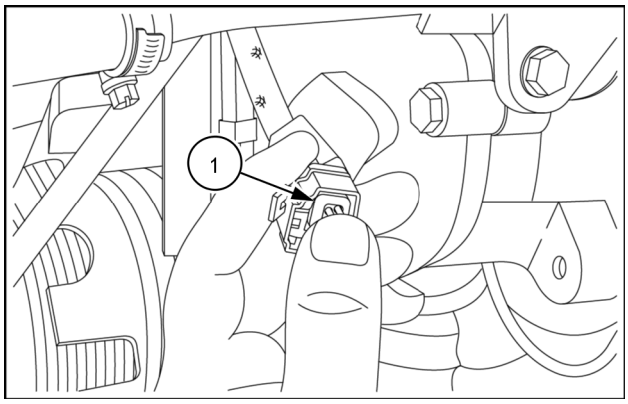
MOIL15TR03678AA 2

3. Correctly insert the engine camshaft sensor **(1)** in its seat.
4. Tighten the sensor retaining screw **(2)**.
5. Clean the electrical contacts **(3)** on the sensor using specific deoxidizing products.



MOIL15TR03676AA 3

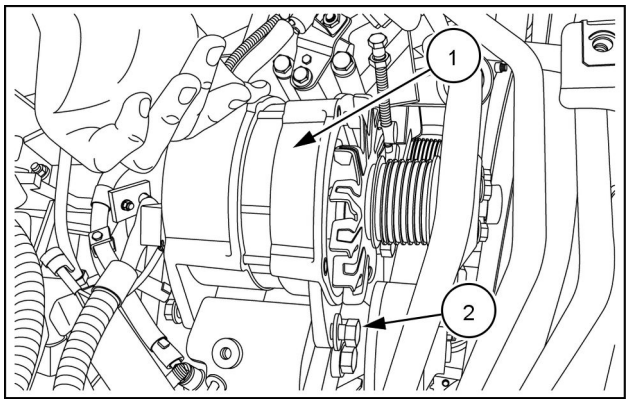
6. Clean the connector contacts **(1)** using specific deoxidizing products.



MOIL15TR03679AA 4

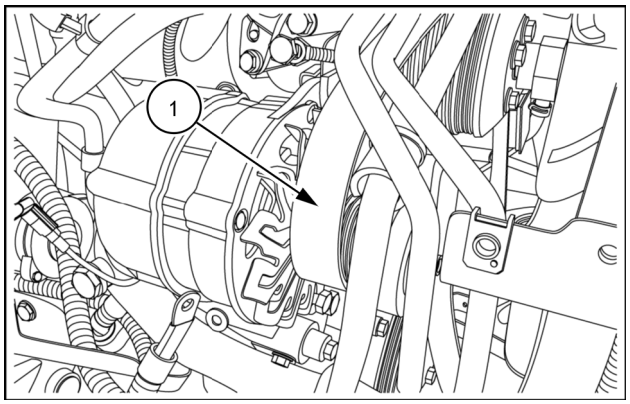
Alternator - Install

1. Clean the area round the alternator thoroughly.
2. Retrieve and thoroughly clean the alternator.
3. Position the alternator **(1)** in its location.
4. Tighten the alternator lower side mounting bolt **(2)**.



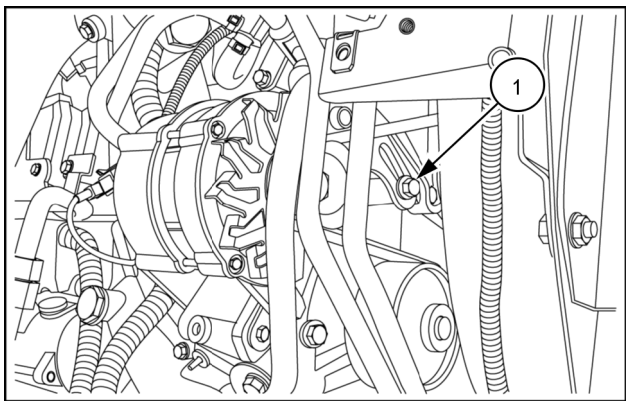
MOIL15TR03653AA 1

5. Correctly position the engine services belt **(1)** on the alternator pulley.



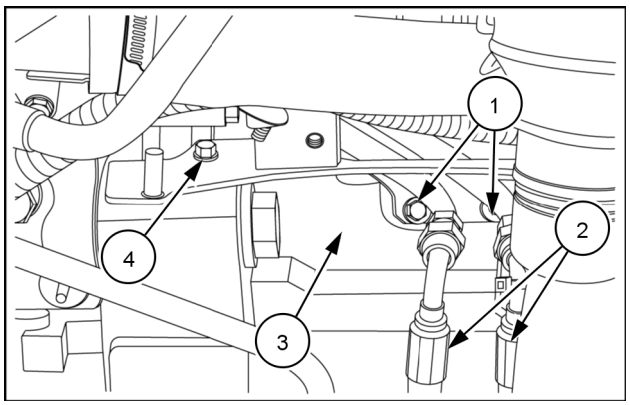
MOIL15TR03654AA 2

6. Tighten the upper side bolt **(1)** of the alternator adjustment bracket.



MOIL15TR03651AA 3

7. Tighten the two lower mounting bolts **(1)** of the power steering pipes **(2)**.
8. Correctly position the lower bracket **(3)** supporting the front right side engine panel.
9. Tighten the bolt **(4)** securing the lower bracket.



MOIL15TR03650AA 4

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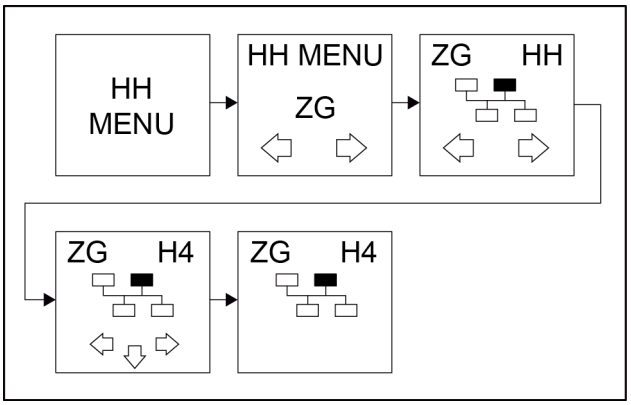
Fuel injection system - 010

Electronic module Instrument control unit - H4 - View software revision level -(ADIC LL) [ZG]

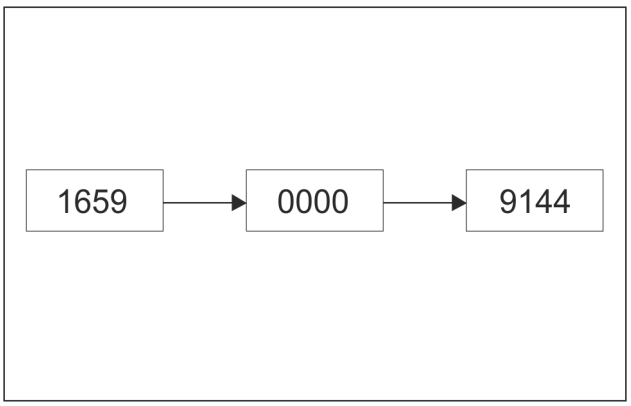
H4 is the menu for the software release visualization and it is common for all modules.

1. Enter the mode using the service switch and navigate the HH menu by using the switches under the steering wheel - View **Electronic module - View (55.640)** .
2. Use ENTER button to select unit ZG and then mode H4 .



MOIL16TR01407AA 1

3. The LCD will then show a sequence of numbers, representing the Software Identifier and the Software Version.
4. The first set of four digits displayed indicates the Software Identifier, this number uniquely defines the application software present in the unit (1659 for ZG).
5. The second and third set of four digits displayed define the release version of the application software. In the example shown above, these digits indicate that the application software in the ZG module is currently release 00.00.91.44.



MOIL18TR00415AA 2

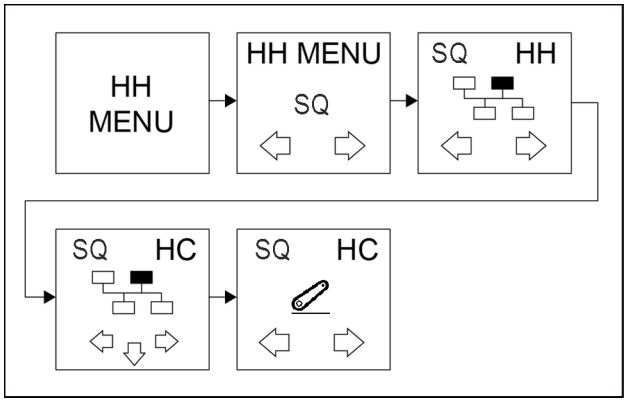
NOTE: *the software version displayed by H4 may not match the software version indicated on the label of the unit if the new software has been downloaded to the unit after manufacture.*

6. At the end of the routine, the display returns to H4 and it then possible to navigate further HH menus.

Electronic module - HC - Clear all stored fault codes - (ICM) [SQ]

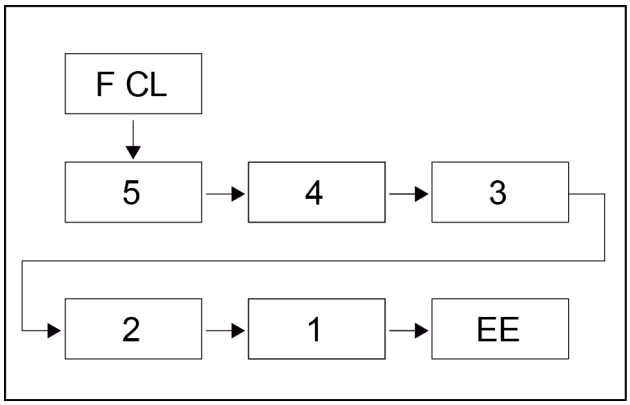
This menu is used to clear all error codes which have been stored in EEPROM of the control module.

Enter the mode using the service switch and navigate the HH menu by using suitable switches – View **Electronic module - View (55.640)** . Select SQ module, HC menu and subsystem.
Use UP or DOWN button to select the required module whose you want to clear error codes, and ENTER to confirm the choice. " F CL" will appear in the upper side of display.



MOIL18TR00819AA 1

In order to start and complete the procedure, DOWN button has to be hold pressed: the visualization changes as shown.
Once " EE" appears, the errors have been successfully cleaned.
If the button is released during the countdown the procedure will be aborted and the display will return to " F CL".



MOIL16TR01422AA 2

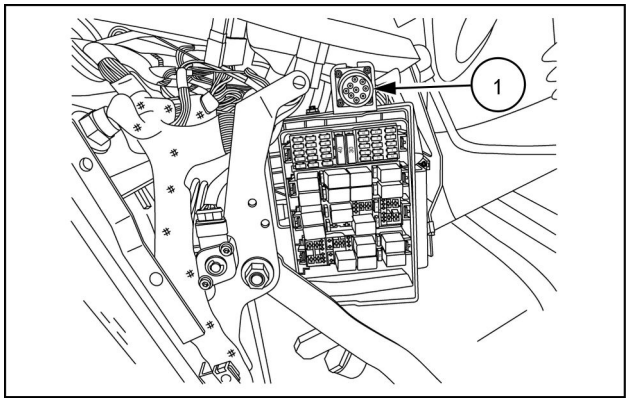
Software - Download

Prior operation:
Disconnect the instrument cluster left-hand side panel

Special tools used in this procedure:

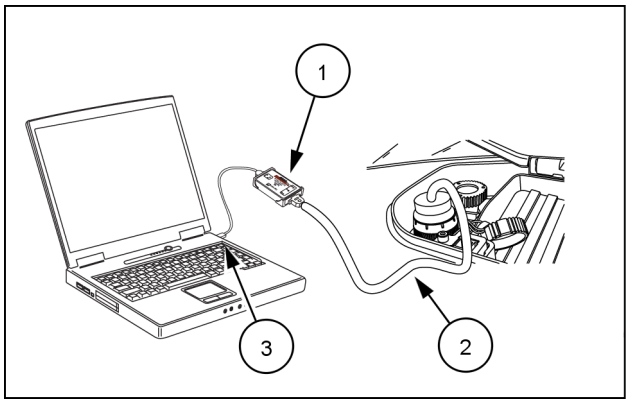
- **380002884** – Dearborn Protocol Adapter 5 (DPA-5)
- **380002880** – Vehicle-to-protocol adapter cable, length of **0.9 m** (**3 ft**)
- **380002883** – Computer -protocol adapter cable, length of **4.6 m** (**15 ft**)

1. Position the ignition key switch ON.
2. Connect the protocol adapter DPA-5 **(1)** Figure **2** to the diagnostic port **(1)** with the vehicle-to-protocol adapter cable **(2)** Figure **2**.



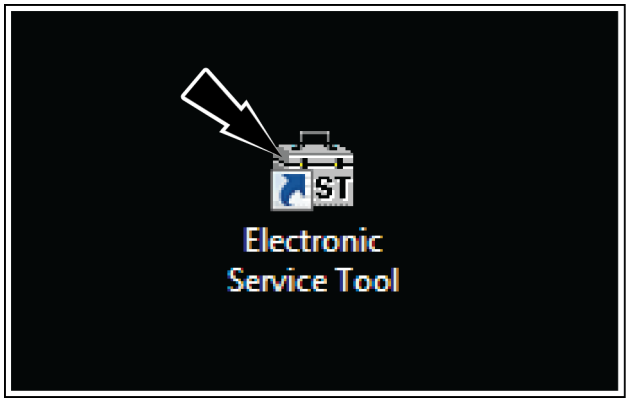
MOIL16TR01233AA 1

3. Connect the protocol adapter to a Universal Serial Bus (USB) port on the computer **(3)** with the computer-to-protocol adapter cable.



MOPH16TR02112AA 2

4. Access the Electronic Service Tool (EST) program by double clicking the icon on the desktop.



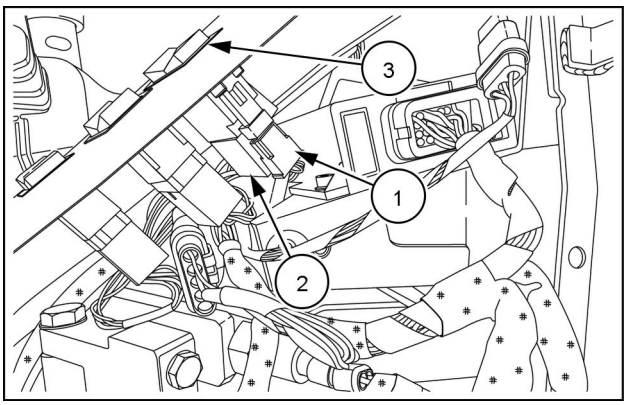
NHIL14RB00725AA 3

Front-Wheel Drive (FWD) engagement control - Remove

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Prior operation:
A. Remove the right-hand panel under the dashboard – See **Cab front panel - Remove - Right-hand side (90.160)**.

1. Disconnect the two electrical connectors **(1)** and **(2)** of the four-wheel drive engagement control switch **(3)**.
2. Push the switch attachment clips and remove it from its seat.
3. Store the switch **(3)** in a suitable location.



MOIL16TR02361AA 1

Front Power Take-Off (PTO) control - Replace

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Prior operation:
A. Disconnect the front power take-off (PTO) control – See **Front Power Take-Off (PTO) control - Remove (55.522)**.

1. Replace the front power take-off (PTO) control with a new one.

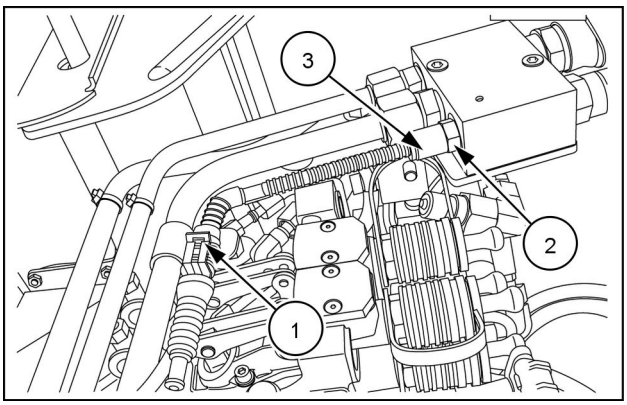
NOTE: *only use original replacement parts when replacing the component.*

Next operation:
A. Reconnect the front power take-off (PTO) control – See **Front Power Take-Off (PTO) control - Install (55.522)**.

Trailer brake coupling manifold switch - Replace

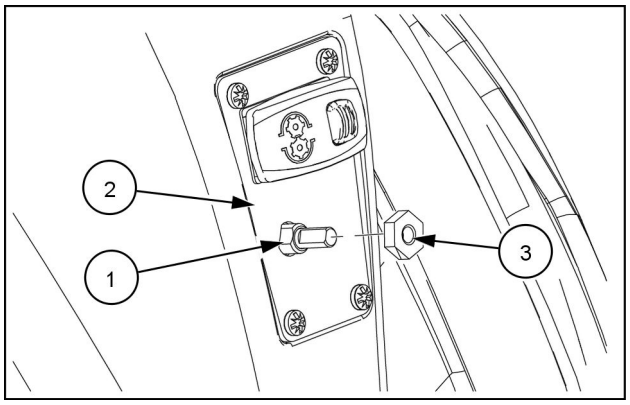
T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80F Without cab [HLRT480FKHLT07195 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA

1. Disconnect the connector **(1)**.
2. Loosen the coupling **(2)** and remove the switch **(3)**.
3. Insert the new switch **(3)** and tighten the coupling **(2)**.
4. Connect the connector **(1)**.



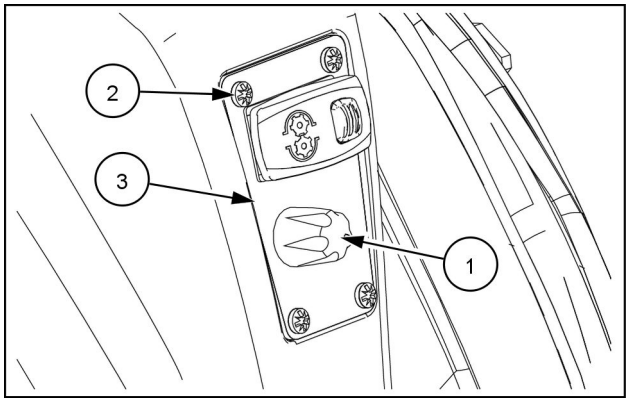
MOIL17TR03508AA 1

6. Correctly position the potentiometer **(1)** in its housing on the support **(2)** and loosen the retaining nut **(3)**.
7. Fix the support **(2)** with the screws **(4)**.



MOIL17TR02105AA 4

8. Correctly attach the knob **(1)** onto the shaft of the potentiometer.



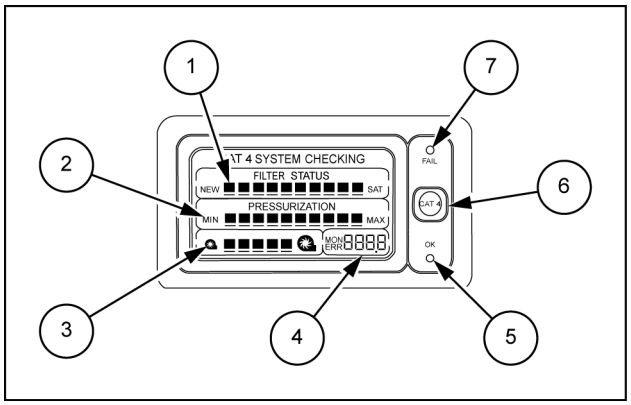
MOIL17TR02104AA 5

Automated recirculation control panel - General information - Category 4 cab

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

The control panel for category 4 cab consists of:

- A liquid crystal display that shows the following information:
  (1) Filter saturation level
  (2) Pressurization level
  (3) Fan speed
  (4) Fault code display sector
- **(5)** Green LED light, on when operating correctly.
- **(6)**Push button to select the filter CAT4 **(6)** operation
- **(7)** Red LED light, on under system alert conditions and/or when error codes are displayed.



MOIL15TR02277AB 1

Monitor mode

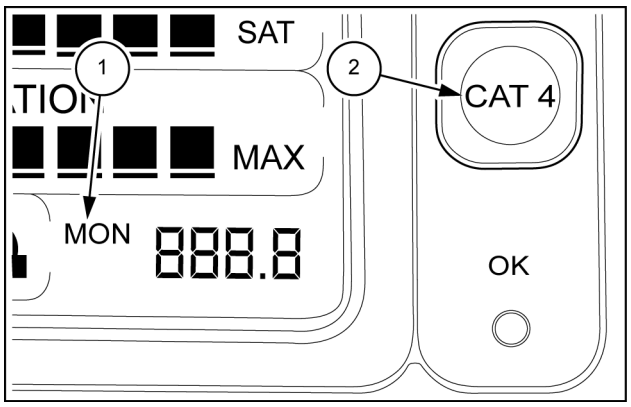
This is an operation mode for set-up, monitoring the system and to resolve problems. The system operates normally according to the level of protection, with the icon MON **(1)** on and value shown in 4 figures.

To activate the Monitor mode, press the button **(2)** for approximately **3 s**.

To exit Monitor mode, press the push button **(2)** for more than **5 s**. The icon MON turns off and the system returns to normal mode.

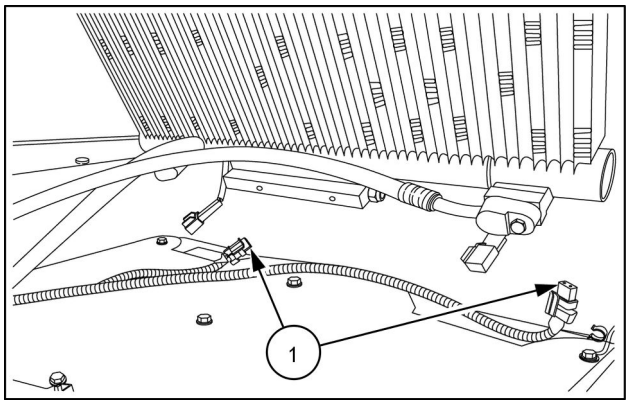
Various information can be displayed in Monitor mode. Each item of information corresponds to a specific system monitoring channel. The different channels are identified by letters or numbers, as shown in the table below.

Use the push button CAT4 **(2)** to navigate between the various channels. To access the next channel, press the button CAT4 **(2)** for less than **0.5 s**. Press the button CAT4 **(2)** for more than **0.5 s** and less than **2 s** to return to the previous channel.



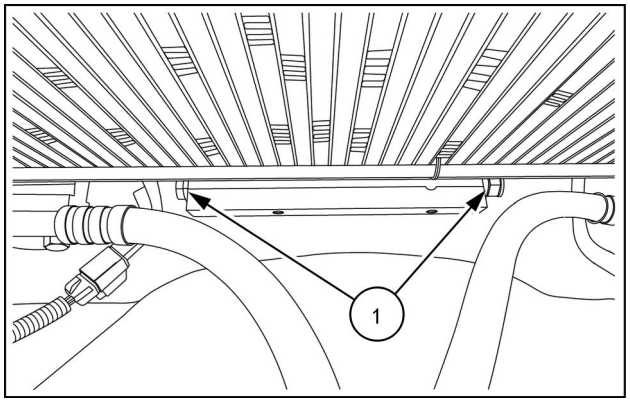
MOIL15TR02146AA 2

5. Disconnect the two power supply connectors **(1)** of the capacitor fans.



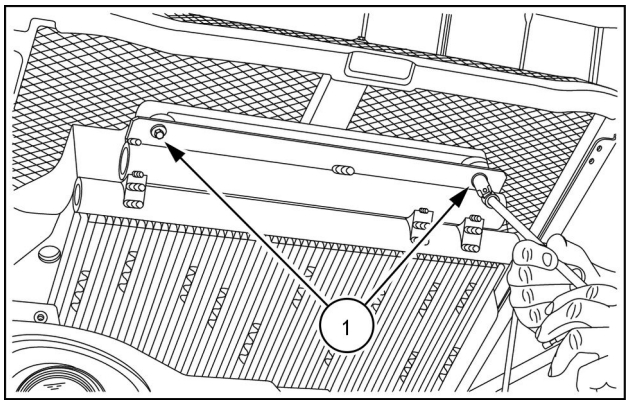
MOIL15TR03680AA 3

6. Partially loosen the capacitor lower retaining bolt **(1)**.



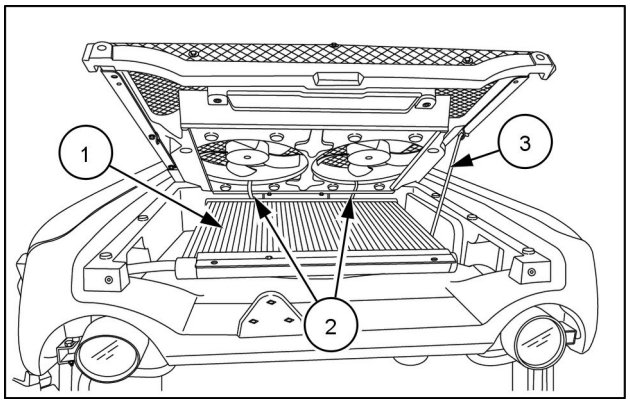
MOIL15TR03682AA 4

7. Loosen the two capacitor upper retaining screws **(1)**.



MOIL15TR03672AA 5

8. Manually lower the air conditioning system capacitor **(1)**.
9. Move the cables **(2)** of the fans and the related connectors above the capacitor **(1)**.
10. Release the support rod **(3)** and manually lower the capacitor access panel.

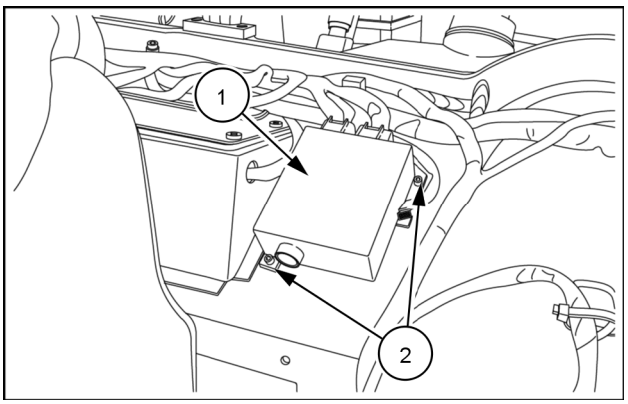


MOIL15TR03683AA 6

Hitch control module - Install

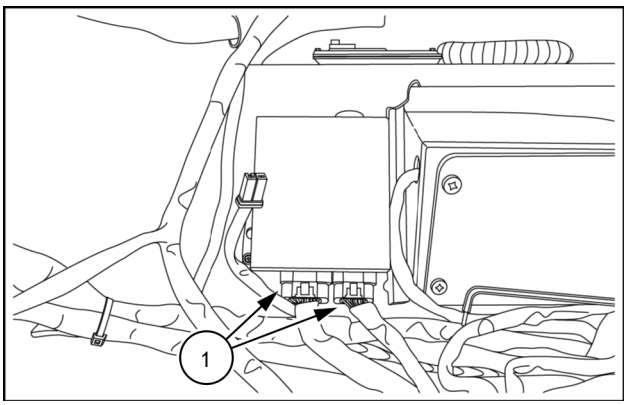
T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

1. Retrieve and thoroughly clean the rear lift (EDC) control unit **(1)**.
2. Thoroughly clean the housing of the rear lift (EDC) control unit **(1)** on the vehicle.
3. Correctly position the control unit **(1)** of the rear lift (EDC) control unit in its housing on the vehicle.
4. Tighten the two retaining screws **(2)** of the rear lift (EDC) control unit **(1)**.



MOIL16TR02681AA 1

5. Connect the two electrical connectors **(1)**.



MOIL16TR02680AA 2

Next operation:
A. Reconnect the left-hand side panel – **Cab left-hand side panel - Install (90.160)**.
B. Perform a functional test of the unit.

Beacon - Replace - Bulb

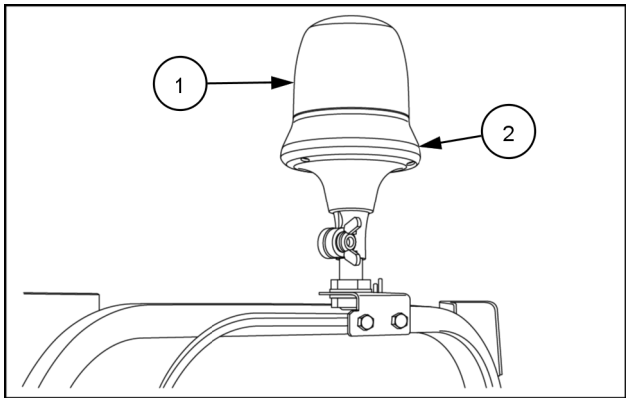
T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100F Without cab [HLRT410FHHLT06645 -]	NA
T4.100LP Without cab [HLRT410LTHLT07868 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110F Without cab [HLRT411FJHLT07110 -]	NA
T4.110LP Without cab [HLRT411LLHLT08186 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80F Without cab [HLRT480FKHLT07195 -]	NA
T4.80LP Without cab [HLRT480L*JLT***** -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90F Without cab [HLRT490FAHLT07208 -]	NA
T4.90LP Without cab [HLRT490LPHLT07434 -]	NA

Prior operation:
A. Disconnect the negative (-) battery cable from the battery – See **Battery cable - Disconnect (55.302)**.

1. Thoroughly clean the rotating beacon.
2. Manually remove the cover **(1)** from its base **(2)** and place it in a suitable location.
3. Remove the bulb from its socket and replace it with a new bulb of the same type.

NOTICE: *when replacing a component, only use an original spare part.*

4. Apply specific antioxidant products for electrical contacts to the bulb socket.
5. Screw the new bulb into its socket.
6. Retrieve and thoroughly clean the beacon cover **(1)**.
7. Manually replace the cover **(1)** on its base **(2)**.



MOIL16TR03320AA 1

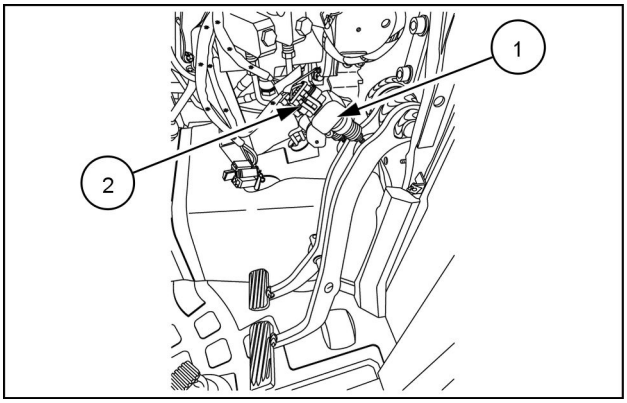
Next operation:
A. Connect the negative (-) battery cable from the battery – See **Battery cable - Connect (55.302)**.
B. Perform a functional test of the beacon.

Brake light switch - Replace - Left-hand switch

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

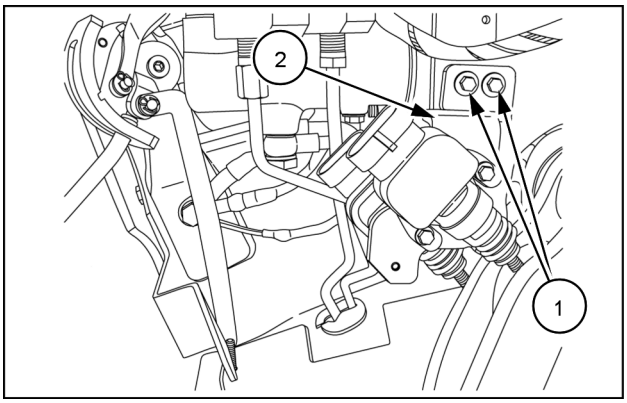
Prior operation:
A. Remove the right-hand panel from the instrument cluster – See **Cab front panel - Remove - Right-hand side (90.160)**.
B. Remove the instrument cluster panel – See **Instrument dash panel - Remove (90.151)**.

1. Carefully clean the area around the brake light switches **(1)**.
2. Disconnect the connectors **(2)** of the brake light switches **(1)**.



MOIL17TR00648AA 1

3. Loosen the two fastening screws **(1)** on the support bracket **(2)** for the brake light switches.

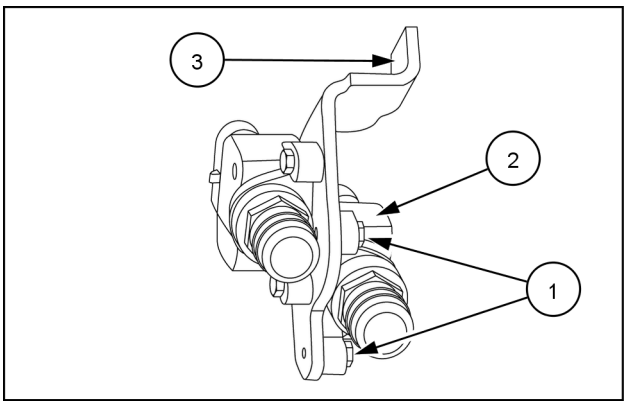


MOIL17TR00657AB 2

4. Loosen the two screws **(1)** fastening the left-hand brake light switch **(2)** to the brake light support bracket **(3)**.
5. Replace the old switch **(2)** with a new one.

NOTICE: *When replacing the component, only use original spare parts.*

6. Tighten the two screws **(1)** fastening the left-hand brake light switch **(2)** to the brake light switch support bracket **(3)**.



MOIL17TR00649AA 3

Instrument cluster - Replace - Left-hand switch

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Prior operation:
A. Disconnect the left-hand switch – See **Instrument cluster - Remove - Left-hand switch (55.408)**.

1. Replace the left-hand switch with a new one.

NOTICE: *only use original replacement parts when replacing the component.*

Next operation:
A. Reconnect the left-hand switch – See **Instrument cluster - Install - Left-hand switch (55.408)**.

Wiring harnesses - Electrical schematic sheet 45 (55.100)
Wiring harnesses - Electrical schematic sheet 57 (55.100)

A. if an open circuit is found, repair or replace the wiring harness as required.

B. If the wiring harness is in good condition, download the correct level of software.

C. If the fault re--occurs, remove and replace the controller.

Wiring harnesses - Electrical schematic sheet 31 (55.100)

2012 - Clutch pedal potentiometer signal too high

Control Module: ICU-SP

Context:
Cause:
Short circuit to ground or open circuit between the clutch pedal potentiometer and the control unit **A-003**, or potentiometer ground open circuit, or the potentiometer is faulty.
Effects:
If the error code occurs while driving it will disable the transmission. Operate the shuttle control lever to return the transmission to power. The tractor may be used with the shuttle lever. If the clutch pedal is depressed the transmission will be disabled again until the shuttle lever has been cycled.

Possible failure modes:

1. Faulty connectors
2. Clutch pedal potentiometer fault
3. Faulty wiring harness
4. Faulty control unit **A-003**

Solution:

1. Check the clutch pedal potentiometer in **Electronic module - H9 - Voltmeter diagnostic (55.640)** mode, channel 48.

   A. Cycle clutch pedal. If the values displayed do not change continuously between 89 and 7, continue to step **2**.

   B. If the values displayed are okay, while still in **Electronic module - H9 - Voltmeter diagnostic (55.640)** mode channel 48, wiggle the wiring harness, the **X-322** connector of the clutch pedal potentiometer **B-011** and the **X-190** connector of the control unit **A-003** to check for an intermittent circuit. Channel 48 values change

   C. if an intermittent circuit is detected. Repair or replace as necessary.
2. Check the **X-322**, **X-190** and **X-700**connectors.

   Ensure the connectors are connected, not damaged, the pins are in the correct position and the fit is tight. Repair or replace as necessary.

   A. If the connectors are okay, continue to step **3**.
3. Check the clutch pedal potentiometer.

   Disconnect the **X-322** connector. While operating the clutch pedal, measure the resistance on the component side of connector between:
   X-322 (Receptacle) pin 2, and pin 3 must indicate a value between **900 Ω** and **3700 Ω**
   and between pin 2 and pin 1 there must be a value between **3700 Ω** and **900 Ω**.

   A. If the resistances indicated are not okay, remove and replace the clutch pedal potentiometer.

   B. If the clutch pedal potentiometer is okay, continue to step **4**.
4. Check for a short to positive voltage.

   Turn the ignition key switch to "ON". Measure the voltage between connector:
   X-322,pin 3 and ground

   A. If the voltage is present, repair or replace the harness as required.

   B. If no voltage is measured, continue to step **5**.
5. Check for a short circuit to + **12 V**.

2088 - Short circuit to +12 V at the HI-LO position synchronizer solenoid valve

Control Module: ICU-SP

Context:
The tractor will drive in only reverse gear and LO range forward gear.

Possible failure modes:

1. faulty connector
2. faulty wiring
3. faulty controller

Solution:

1. When the cause of the error code has been rectified, clear the error code and test the system for normal operation.

   Check the solenoid valve with the diagnostic procedure HH.

   Access mode **Electronic module - H9 - Voltmeter diagnostic (55.640)** for the SB control unit and select ch. 58. With the engine running, in slow range forward gears LO (symbol of the hare off) press the HI button on the gear lever. The display will show a value which goes from 0 to 700 - 900 and then returns to 0 (activation of the solenoid valve for switching the synchroniser to HI-LO).

   A. If nothing happens on the display, the direction of movement of the drive line is not inverted, go to step **2**.
2. Check the connector **X-186** of the solenoid valve **Y-004**, the connector of the main wiring **X-700** and the connector of the control unit, **A-003**, **X-190**.

   Ensure the connectors are connected and not damaged, that the pins are in the correct position and the fit is tight. Repair or replace as required.

   A. If the connectors are OK, go to step **3**.
3. Check for a short circuit to **+12 V**.

   Disconnect the connector **X-186**. Turn the ignition key switch to ON. Measure the voltage between:
   X-186 (Receptacle) pin 1 and ground
   X-186 (Receptacle) pin 2 and ground

   A. If there voltage is detected, turn the ignition key switch to OFF. Disconnect the control unit connector **X-190**. Turn the ignition key switch to ON.

   B. If voltage is still indicated, repair or replace the wiring harness as necessary.

   C. If no voltage is measured, download the correct level software.

   D. If the error is repeated, remove and replace the control unit.

Wiring harnesses - Electrical schematic sheet 26 (55.100)

3003 (DTC 112-04) - Foot Throttle Sensor - Signal Below Range Min

NOTE: *When the cause of the fault code has been rectified, clear the fault code and test the system for normal operation.*

Cause:

Possible failure modes:

1. Fault in the connector
2. Faulty foot throttle pedal sensor
3. Faulty wiring
4. Faulty controller.

Solution:

1. Check the foot throttle pedal potentiometer in H9 mode channel 8.

   Operate the foot throttle pedal.

   A. If the values displayed do not change continuously between **250 – 4500 mV**, go to step **2**.

   B. If the displayed values are OK, while still in H9, channel 8, wiggle the wiring, the connector of the accelerator pedal **X-321** and the connector of the control unit **X-450** , to check for an intermittent circuit. Channel 8 values will change if an intermittent circuit is detected, repair or replace as required.
2. Check the **X-321** connector of the food throttle pedal and the **X-450** connector of the control unit

   Check whether the connectors are plugged in, there is no damage, the pins are in the right positions and the connectors are secure. Repair or replace as required.

   A. If the connectors are OK, go to step **3**.
3. Check for **5 Volts**.

   Disconnect the connector **X-321**. Turn the ignition switch to ON. Measure the voltage between connector **X-321** pin 1 and ground.

   A. If the voltage indicated is not approximately **5 Volts**,repair or replace the harness as required

   B. If the voltage is approximately **5 Volts**, go to step **4**.
4. Check for open circuit.

   Disconnect the **X-450** connector of the control unit **A-005**. Check between the **X-450 (Receptacle) pin 5** connector and the **X-321 (Receptacle) pin 3** connector .

   A. If an open circuit is indicated, repair or replace the wiring as required.

   B. If an open circuit is not indicate, go to step **5**.
5. Check for a short circuit to ground.

   Check between the **X-321 (Receptacle) pin 3** connector, and ground.

   A. If there is a short circuit to ground, repair or replace the wiring harness as necessary.

   B. If the wiring harness is still in good condition, remove and replace the foot throttle pedal **B-014**.

   C. If the fault is still present, download the correct software version.

   D. If the fault re--occurs again, remove and replace the control unit **A-005**.

4. Disconnect the engine cylinder wiring harness from the injector valve cover at the **X-940** connector. Use a multimeter to check the voltage on the injector (valve) cover side of the **X-940B** connector between pin E and frame ground and between pin F and frame ground. Should be no voltage.

   A. If there is no voltage on either or both pins to frame ground, leave the connector **X-940** disconnected and go to Step **5**.

   B. If there is voltage between both the pins and the frame ground, there is a short to high source condition on the engine cylinder wiring harness between the **X-940** connector of the valve cover and the **X-939** connector of the cylinder cover on the ECU. Locate and repair the shorted conductor.

5. Remove the injector (valve) cover and disconnect the injector wiring harness from terminal 2 (ring terminal on the low side) of injector 4. Use a multimeter to check for voltage on injector 4, from terminal 2 to frame ground. Should be no voltage.

   A. If there is no voltage, there is a fault in the cylinder 4 injector solenoid valve coil, replace the injector.

   B. If there is voltage, there is a short to high source condition in the injector circuit of cylinder 4, between the injector 4 terminals and the **X-940B** commutator. Locate and repair the shorted conductor.

6. Disconnect the engine cylinder wiring harness from the **X-940** connector on the injector (valve) cover and use a multimeter to check the resistance on the injector (valve) cover side of the **X-940B** connector between pin E and F. The resistance must be approximately **0.4 – 0.5 Ω**.

   A. If the resistance is within range, there is a short circuit in the injector wiring harness, between the **X-940** connector of the injector (valve) cover and the **X-939** connector of the cylinder wiring harness on the ECU, locate and repair the short circuit.

   B. If the resistance was lower than range minimum, continue to step **7**.

7. Remove the injector (valve) cover and disconnect the injector wiring harness from terminal 2 (ring terminal on the low side) of injector 4. Use a multimeter to check the resistance on cylinder injector 4, from terminal 1 to terminal 2. The resistance must be approximately **0.4 – 0.5 Ω**.

   A. If the resistance is within range, there is a short circuit in the injector wiring harness, between the injector 4 terminals and the **X-940B** connector. Locate and repair the short circuits.

   B. If the resistance is lower than the minimum permitted range, there is a fault in the cylinder 4 injector solenoid valve coil.Replace the injector.

Wiring harnesses - Electrical schematic sheet 23 (55.100)

3177 (DTC 54C-03) - Engine overspeed detected

Context:
The Engine Control Unit **A-010** (ECU) has detected an engine over-speed condition. An engine over-speed can occur both during certain engine operating conditions without any defect in a component, for example downhill driving, or as a result of, for example another ECU error. This error is for information purposes and is initiated by engine speed in excess of **2800 RPM** for over 5 seconds and is reset once the engine speed is below the threshold for over 2 seconds. Though this error by itself does not require any action, the over-speed state can cause an injection shutoff request within the ECU. If this error reoccurs frequently, check driving conditions of the vehicle, engine speed acquisition and injection system for quantity set-point and actual value during fault recognition, check also for other ECU errors.

3265 (DTC 1E3-03) - Overrun monitoring - injection time too long

Context:
The engine control unit **A-010** (ECU) has detected that injection time is too long. The sum of all torque-forming energizing times of an individual cylinder exceeds the limit, calculated from the map (depending on the engine speed and the time since the overrun monitoring is active) for more than 100 test events. When the engine is in overrun operation the monitoring becomes active and the current injection energizing time is compared with a maximum permissible time limit. If the limit is exceeded an ECU recovery (reset) is triggered and if the error reoccurs in the same driving cycle, the torque-determining power stages are irreversibly shut off. The basic idea is that the operator reacts to an unintentional torque increase, caused by a malfunction of the ECU, by releasing the accelerator pedal (reducing engine speed) which causes the engine to enter the overrun operation mode. Overrun monitoring is only released if various conditions are met, such as no accelerator pedal activation, no activated cruise control, no intervention of the vehicle dynamic control or gearbox control is present, etc. This failure could be the result of electronic disturbances, a requested torque increase via tester, the wrong application of injection relevant parameters, or a defective ECU. If this failure persists, the ECU may need to be replaced.

Wiring harnesses - Electrical schematic sheet 22 (55.100)
Wiring harnesses - Electrical schematic sheet 23 (55.100)

3672 (DTC 68B-04) - Short circuit to ground on EGR Out2 pin A35 error for H-bridge

Context:
The engine control unit (ECU) has detected a short circuit to negative battery or frame ground on output 2 for the H bridge.

Cause:
The EGR valve control circuit or wiring harness is in short circuit to the negative battery or frame ground.

Possible failure modes:

1. Wiring shorted to minus battery or frame ground.
2. Faulty engine control unit (ECU)

Solution:

1. Check for active fault codes.

   (1) Verify that the fault code is still active.
   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (2) Use the electronic service tool (EST) to clear all the fault codes.

   (3) To check for fault codes: Start and operate machine.

   The fault code 3672 is not recorded again to return the machine to service.

   A. If the fault code 3672 is active and recorded again. Go to step **2**.
2. Verify that the wiring and connectors are free from damage.

   (1) Turn the key switch to OFF.

   (2) Inspect the **X-939** connector of the ECU and the **M-101** terminals of the EGR valve. All connections should be secure, tight, free of corrosion, abrasion and damage.

   (3) Inspect the wiring harness from the **X-939** connector of the ECU to the **M-101** EGR valve terminal. Check that the wiring harness is free of damage, corrosion, abrasion and incorrect attachment.

   A. If the connectors are secure and the wiring harness is free of damage. Go to step **3**.

   B. The connectors or the wiring harness are damaged. Repair or replace the wiring harness or connectors as required.
   Return to step **1** to confirm the fault has been eliminated.
3. Measure the resistance through the wiring harness to frame ground.

   (1) Turn the key switch to OFF.

   (2) Disconnect the terminals of the **M-101** EGR valve. Disconnect the **X-939**connector of the ECU.

   (3) Measure the resistance between the **X-939 (Receptacle) pin 50** connector for the ECU and frame ground. The resistance should be greater **20,000 Ω**. Wiggle the harness during the measurement to reveal an intermittent condition.

   (4) Measure the resistance between the **X-939 (Receptacle) pin 35** connector for the ECU and frame ground. The resistance should be greater **20,000 Ω**. Wiggle the harness during the measurement to reveal an intermittent condition.

   A. If resistance is greater than **20,000 Ω**, Go to step **4**.

   B. The resistance is less than **20,000 Ω**. There is an short circuit in the wiring.Repair/replace wiring as needed.

A. If the resistance is below **10.0 Ω**, the damaged wiring is in the engine harness between connector X-943 pin 3, wire 314 (GN) to pin 4, wire 319 (GN/WH). Locate and repair the damaged wiring harness.

B. If the resistance is greater than **10.0 Ω**, continue with step **6**.

6. Check to see if the wiring is open. Place the ignition key switch in the OFF position. Use a multi-meter to measure the resistance from the engine harness side of connector X-943 pin 3, wire 314 (GN) to connector X-937 pin 7, wire 314 (GN). The resistance should be less than **10.0 Ω**.

   A. If the resistance is greater than **10.0 Ω**, the damaged wiring is in the engine harness between connector X-943 pin 3 and connector X-937 pin 7, wire 314 (GN). Locate and repair the damaged wiring harness.

   B. If the resistance is less than **10.0 Ω**, continue with step **7**.

7. Check software version is at the most current status.

   A. If the software version is not up to date, re-flash software and recheck fault is present.

   B. If the fault code is still active and present, replace the ECU.

   C. If the fault code has cleared, return machine to proper service.

3760 (DTC 5E3-04) - Level 2 Monitoring : Diagnosis air path limitation due to a functional control unit monitoring forced by ECU monitoring level 2

Context:

The torque request can be influenced from many vehicle functions (foot throttle pedal, transmission etc.) which are in some cases additive, in some cases as maximum and in some case as limitation. The finally requested torque on the engine must not be similar to the engine torque output, as the request takes into consideration system tolerances (e.g. due to learning factors, but also due to temperatures and pressures), i.e. the final torque request is "virtual" in the way, that the real torque would be correct.

As the air control (Boost pressure, EGR rate etc) is dependant on the torque input, the "virtual" torque request would lead to a wrong set point and therefore to wrong emissions. Therefore the input torque for the Air control is calculated separately - called "Lead torque". This complex structure can lead to a "lead" torque request, which is higher than accepted by engine. Therefore the total requested "lead" torque is compared to a maximal allowed (inner) torque.

If the requested torque is higher, the system layout is not correct (calibration error in one of the electronic vehicle controllers) and a failure is stored. If this fault occurs a fatal error within the engine control unit (ECU) or an incorrect data set calibration of the electronic vehicle controller or ECU has occurred. Check for other error codes in the vehicle controllers and continue to fix these errors. If no other vehicle controller errors are present, try to flash the vehicle controller with the proper data set and perform the calibration procedures. If the error persists, try to flash the ECU correctly with the proper data set. If the error still persists, replace the ECU.

3812 (DTC 2CC-00) - Physical Range Check high for ECU temperature sensor

Context:
The engine control unit (ECU) has detected an internal temperature above **130 °C** (**266 °F**). This fault can be caused by a cooling system problem, high environmental temperatures or heavy engine use. If the environmental temperature is not too high and the machine has not been used heavily, let the engine cool down. Then check there is the correct amount of coolant in the cooling system. Make sure the radiator is not clogged or restricted of air flow.
High electrical system voltages can contribute to this fault. Verify that the system voltage is correct and that there is not a problem with the alternator charging system.

Possible failure modes:

1. High engine temperatures
2. High system voltage
3. Faulty engine control unit (ECU)

Solution:

1. Check the error code is still present on the EST.

   (1) Access the error code screen on the electronic service tool (EST) and monitor the error codes.

   (2) Check that there are no fault codes pertaining to high battery voltage to the engine control unit (ECU) or high fluid temperatures.

   The error code 3812 is active with other error codes like FC3051, FC3518 or FC3007. Identify and resolve these error codes before troubleshooting the FC3812code.

   The error code 3812 is not recorded again. OK to return the machine to service.

   A. If the fault code 3812 is active and recorded again. temporarily replace the engine control unit (ECU) and retest. Return to step **1** to confirm the fault has been eliminated.

Wiring harnesses - Electrical schematic sheet 22 (55.100)
Wiring harnesses - Electrical schematic sheet 23 (55.100)

3849 (DTC 35A-04) - Zero Fuel Calibration by Lambda (ZFL) : DFC reporting error state on comparing energizing time to Min value injector 2

Context:
This fault has been generated due to the injector 2 programming being incorrect. This fault may be the result of incorrect programming/updating of the engine control unit (ECU) or an internal fault in the injector. Using the Electronic Service Tool (EST), Easy-Engine software, check the injector code matches the injector code used for that cylinder. Reprogram the engine control unit (ECU) with the correct injector code. Update the engine control unit (ECU) with the correct data. If the error persists, replace the injector.

Wiring harnesses - Electrical schematic sheet 23 (55.100)

4115 - Rear remote no.2 – control message not plausible

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Control Module: REHR

Context:
The control solenoid valve 2 (**A-013**, **A-014**, **A-012** depending on the programming) is faulty or the related circuit is short circuited. (control signal always present on the valve). The rear lift does not work. The 2 EHR valve moves to neutral position.

Cause:
Faulty solenoid valve
Faulty wiring
Faulty control unit.

Solution:

1. Disconnect the connection related to the solenoid valve involved (**A-013**, **A-014**, **A-012** depending on the programming). Check that the wiring between the control unit and the solenoid valve is intact and properly connected. Check that the pins of the connectors are not oxidized. Check that the pins are properly connected to the connector.

   If the valve 2 is **A-013**.

   Disconnect the supply connector **X-040A X-040B X-040C X-040D** and the connector **X-396** of the valve **A-013**.

   Check for non continuity between the pins:

   X-040A X-040B X-040C X-040D pin 9 and **X-040** pin 10

   X-396 pin 1 and **X-396** pin 4.

   If the valve 2 is **A-014**.

   Disconnect the supply connector **X-040A X-040B X-040C X-040D** and the connector **X-397** of the valve **A-014**.

   Check for non continuity between the pins:

   X-040A X-040B X-040C X-040D pin 9 and pin 10

   X-397 pin 1 and **X-397** pin 4.

   If the valve 2 is **A-012**.

   Disconnect the supply connector **X-040A X-040B X-040C X-040D** and the connector **X-443** of the valve **A-012**.

   Check for non continuity between the pins:

   X-040A X-040B X-040C X-040D pin 9 and **X-443** pin 1

   X-040A X-040B X-040C X-040D pin 10 and **X-443 (Receptacle) pin 4** .

   A. If there is continuity, repair or replace the wiring as necessary.

   B. If there is no continuity, go to .**2**.
2. Check that the valve is correctly powered at 12V and that it is not damaged.

4174 - EHR control no.2 open circuit or short to GND

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Control Module: EDC+EHR

Context:
When the lever 2 (**S-064**) voltage value is read below 15% of the voltage supply (0.73V with 5V power supply) the circuit is considered open (or short circuit to ground).

Cause:
Wiring harness faulty
Lever faulty
Control unit fault.

Solution:

1. Check the integrity of the wiring harness and that the connections are secure, the pins and connectors are properly connected, not oxidized or damaged.

   A. If the wiring harness or the connectors do not have the characteristics indicated above, repair or replace the wiring harness as necessary.

   B. If the wiring harness and the connectors have the characteristics indicated above, go to **2**.

2. Check that there are no short circuits to ground.
   Turn the ignition switch to off. Disconnect the **A-002** connector for the **X-030** control unit and the **X-044A** lever connector (**S-063** lever 1; **S-064** lever 2; **S-065** lever 3).
   Check that there is no continuity between pins:
   X-044A (Plug) pin 5 and ground
   X-044A (Plug) pin 6 and ground.

   A. If there is continuity, repair or replace the wiring harness as necessary.

   B. If there is no continuity, go to **3**.

3. Check the electrical continuity of the wiring harness between the lever (**S-064**) and the control unit (**A-002**).
   Check for continuity between pins:
   X-044B pin 5 and **X-030 (Receptacle) pin 34**
   X-044B pin 6 and **X-030 (Receptacle) pin 16**.

   A. If there is no continuity, repair or replace the wiring harness as necessary.

   B. If continuity is correctly present, go to **4**.

4. Make sure that the lever 2 **S-064** is not damaged.

   A. If the lever is damaged, repair or replace as required.

   B. If the lever is not damaged, go to **5**.

5. Make sure that the **A-002** control unit is not damaged.

   A. If the **A-002** control unit is damaged, replace the controller.

Wiring harnesses - Electrical schematic sheet 33 (55.100)

B. If an open circuit is not indicated, continue to step **5**.

5. Check for a short circuit.

   Disconnect connector **X-384** and the connector **X-388**.

   Check between connector **X-384 (Receptacle) pin 36** and connector **X-384 (Receptacle) pin 35** (+5V).

   A. In case of detected electrical continuity, repair or replace the harness as required.

   B. If a electrical continuity is not detected, continue to step **6**.

6. Check for a short to a positive voltage.

   Disconnected connector **X-388**.

   Turn the ignition key switch ON.

   Measure the voltage between connector **X-384 (Receptacle) pin 36** and ground.

   A. If a voltage is indicated, repair or replace the harness as required.

   B. If a voltage is not indicated, remove and replace the joystick **S-060**.

   C. If the fault is still present, download the correct version of software.

   D. If the error code occurs again, remove and replace the mid mount control unit MMV **A-004**.

Wiring harnesses - Electrical schematic sheet 16 (55.100)
Wiring harnesses - Electrical schematic sheet 35 (55.100)

4776 - Proportional valve X-axis: Current feedback too high

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Control Module: MMV

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
The mid mount control module MMV **A-004** has detected a current from the X-axis mid mount valve solenoids **Y-035** and **Y-036** while not enabled.

Possible failure modes:

1. Faulty connector.
2. Faulty wiring harness.
3. Faulty EA1 solenoid valve.
4. Faulty EB1 solenoid valve.
5. Faulty mid mount control unit.

Solution:

1. Check the EA1 **Y-035** and EB1 **Y-036** solenoid valves, connectors **X-416** and **X-417**, the inline harness connector **X-393** and the mid mount control unit connector **X-384**.

   Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight.

   A. If an anomaly is present, repair or replace as required.

   B. If the connectors are okay, continue to step **2**.
2. Check the EA1 **Y-035** and EB1 **Y-036** solenoid valves.

   Disconnect connectors **X-416** and **X-417**.

   Measure the resistance on the components:

   Y-035 whitin pin 1 and pin 2.

   Y-036 whitin pin 1 and pin 2.

   A. If the resistance value indicated is not between **4.5 Ω** and **5.0 Ω**, replace the relevant solenoid valve.

   B. If the resistance value indicated is between **4.5 Ω** and **5.0 Ω**, continue to step **3**.
3. Check for a short circuit.

   Disconnect connectors **X-384**, **X-416** and **X-417**.

   Check for a short circuit between:

   X-416 pin 1 and pin 2.

   X-417 pin 1 and pin 2.

   A. In case of detected electrical continuity, repair or replace as required.

4852 - Proportional valve X-Axle: short circuit between HSD A and HSD B and open circuit on HSD A

T4.100F With cab [HLRT410FVHLT06687 -]	NA
T4.100LP With cab [HLRT410LJHLT07888 -]	NA
T4.110F With cab [HLRT411FHHLT05607 -]	NA
T4.110LP With cab [HLRT411LKHLT08505 -]	NA
T4.80F With cab [HLRT480FTHLT07324 -]	NA
T4.80LP With cab [HLRT480LEHLT07889 -]	NA
T4.90F With cab [HLRT490FHHLT07874 -]	NA
T4.90LP With cab [HLRT490LHHLT07864 -]	NA

Control Module: MMV

Context:
Short circuit between the outputs HSD A and HSD B of the X axis proportional valve, reversed valve movement. The X is disabled.

Cause:
Faulty wiring.
Faulty control unit.

Solution:

1. Check that the wiring of the control unit and of the solenoid valve is intact and properly connected. Check that the pin of the connectors are not oxidized and that they are properly connected to the connector.

   Disconnect the connector **X-384** of the control unit **A-004** and the connectors **X-416** of the solenoid valve EA1 X **Y-035**, **X-417** of the solenoid valve EB1 X **Y-036** and the connector of the main wiring **X-393**.

   Check for continuity between the pin:

   X-384 (Receptacle) pin 12 with **X-393A (Plug) pin 1** and **X-416** pin 1.

   X-384 (Receptacle) pin 13 with **X-393A (Plug) pin 2** and **X-416** pin 2 and **X-417** pin 2.

   X-384 (Receptacle) pin 22 with **X-393A (Plug) pin 3** and **X-417** pin 1.

   Check that there is no continuity between the pin:

   X-384 (Receptacle) pin 12 with **X-384 (Receptacle) pin 13** and **X-384 (Receptacle) pin 22** .

   X-393A (Plug) pin 1 with **X-393A (Plug) pin 2** and **X-393A (Plug) pin 3** .

   A. If problems are found, repair or replace the wiring as necessary.

   B. If no problems are found, go to .**2**.
2. Check that the solenoid valves **Y-035** and **Y-036** are not damaged.

   A. If the solenoids are damaged, replace them.

   B. If no problems are found proceed to step **3**.
3. Check that the control unit **A-004** is correctly powered and is not damaged.

   A. If the control unit is damaged, replace the control unit.

Wiring harnesses - Electrical schematic sheet 37 (55.100)

B. If the wiring harness circuit is not open, go to step **5**.

5. Check the **B-006** rear PTO speed sensor.

   Measure the resistance between pin 1 and pin 3 of the **X-341** connector for the **B-006** rear PTO speed sensor.

   A. If the resistance indicated is not approximately **680 Ω** at **20 °C**, remove and replace the **B-006** rear PTO speed sensor.

   B. If the speed sensor is okay, go to step **6**.

6. Check the ADIC **A-005** instrument panel control unit.

   Restore all the electrical connections.

   Download the correct software version to the ADIC **A-005** instrument panel control unit.

   A. If the error is repeated, remove and replace the ADIC **A-005** control unit.

Wiring harnesses - Electrical schematic sheet 30 (55.100)

14913 - ICU-SR missing

Control Module: ADIC

Context:
The control unit does not see the four−wheel drive control unit, front power take−off and front lift.

Possible failure modes:

1. Error on the BUS CAN line
2. Faulty analog/digital instrument cluster (ADIC)

Solution:

1. When the cause of the fault code has been rectified, clear the fault code and test the system for normal operation.

   Check the connectors **X-450** of the ADIC control unit **A-005**, **X-190** of the ICU SP control unit **A-003**, **X-064** of the ICU SR control unit **A-001**, **X-030** of the EDCcontrol unit **A-002** and **X-376** of the diagnosis pin **J-004**.

   A. Ensure the connectors are connected and not damaged, that the pins are in the correct position and the fit is tight. Repair or replace, as required.

   B. If the connectors are ok, continue to step **2**.

2. Check for open circuit on the BUS line.

   Disconnect the connectors **X-460**, **X-450**, **X-064**, **X-190** and **X-030** of the control units. Test on the connectors between the pins:
   X-376 (Plug) pin C and **X-450 (Receptacle) pin 3**,
   X-376 (Plug) pin D and **X-450 (Receptacle) pin 4**,
   X-376 (Plug) pin C and **X-064 (Receptacle) pin 12**,
   X-376 (Plug) pin D and **X-064 (Receptacle) pin 13**,
   X-376 (Plug) pin C and **X-030 (Receptacle) pin 12**,
   X-376 (Plug) pin D and **X-030 (Receptacle) pin 13**,
   X-376 (Plug) pin C and **X-030 (Receptacle) pin 12**,
   X-376 (Plug) pin D and **X-190 (Receptacle) pin 13**,

   A. If an open circuit is indicated, repair or replace the wire as necessary.

   B. If the wiring is okay, continue to step **3**.

3. Check ADIC control unit terminator.

   Reconnect the connector **X-450** to the ADIC control unit **A-005**. Test the resistance between pins:
   X-376 (Plug) pin C and **X-376 (Plug) pin D**,

   A. If the resistance indicated is not approximately **120 Ω** replace the ADIC control unit **A-005**, because the termination is faulty.

   B. If the termination is okay, continue to step **4**.

4. Check ICU SR control unit termination **A-001**.

   Re−connect connector **X-064** to the control unit. Measure the resistance between the connector pin:
   X-376, pin C, and **X-376**, pin D.

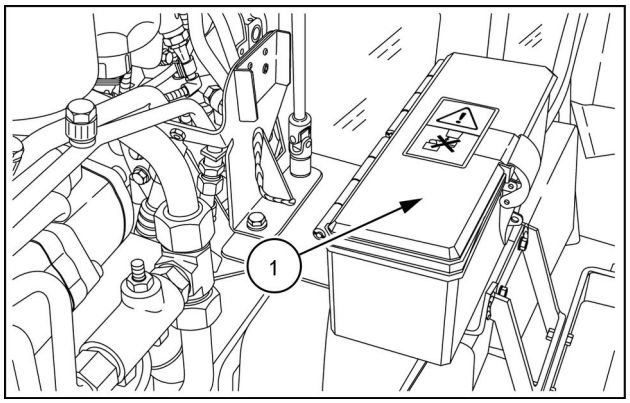
   A. If the resistance indicated is not approximately **60 Ω** replace the EDC control unit **A-002**, because the termination is faulty.

   B. If the error is repeated, download the correct software release.

   NOTE: *This error code can occur in case of replacement of the original instrument cluster with one recovered from another machine equipped with the SR control unit: it follows that the presence of the control unit remains*

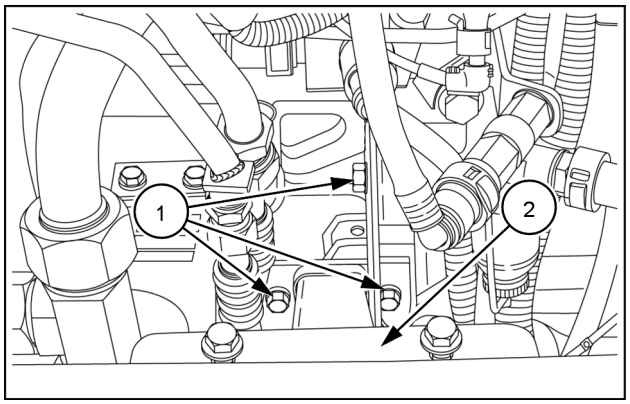
Tool box - Install

1. Retrieve and carefully clean the tool box **(1)**
2. Carefully clean the seat of the tool box on the vehicle.
3. Correctly position the tool box in its seat on the vehicle.



MOIL15TR03685AA 1

4. Tighten the three fastening screws **(1)** on the bracket **(2)** for the tool box.



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Next operation:
A. Reattach the windshield washer fluid reservoir – See **Windshield washer fluid reservoir - Install (55.518)**.

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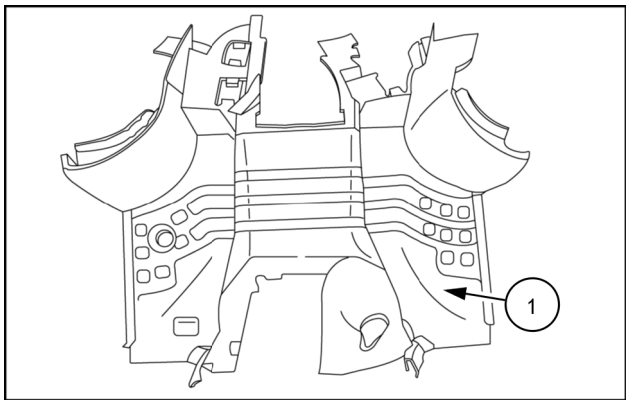
Cab interior - 151

T4.100F With cab [HLRT410FVHLT06687 -], T4.100F Without cab [HLRT410FHHLT06645 -], T4.100LP With cab [HLRT410LJHLT07888 -], T4.100LP Without cab [HLRT410LTHLT07868 -], T4.110F With cab [HLRT411FHHLT05607 -], T4.110F Without cab [HLRT411FJHLT07110 -], T4.110LP With cab [HLRT411LKHLT08505 -], T4.110LP Without cab [HLRT411LLHLT08186 -], T4.80F With cab [HLRT480FTHLT07324 -], T4.80F Without cab [HLRT480FKHLT07195 -], T4.80LP With cab [HLRT480LEHLT07889 -], T4.80LP Without cab [HLRT480L*JLT*** -], T4.90F With cab [HLRT490FHHLT07874 -], T4.90F Without cab [HLRT490FAHLT07208 -], T4.90LP With cab [HLRT490LHHLT07864 -], T4.90LP Without cab [HLRT490LPHLT07434 -]**

8. Replace the floor mat **(1)** with a new one.

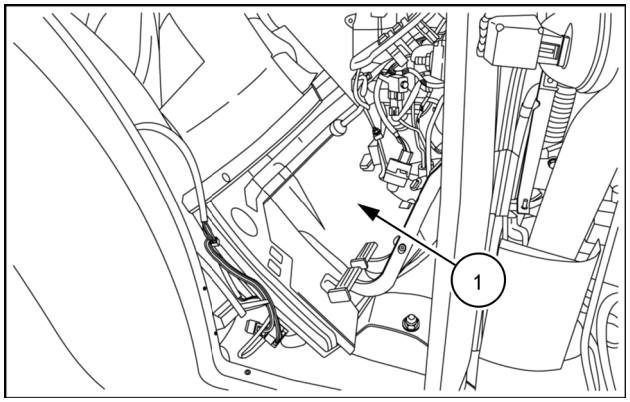
NOTICE: *when replacing a component, only use an original spare part.*

9. Thoroughly clean the cab floor.



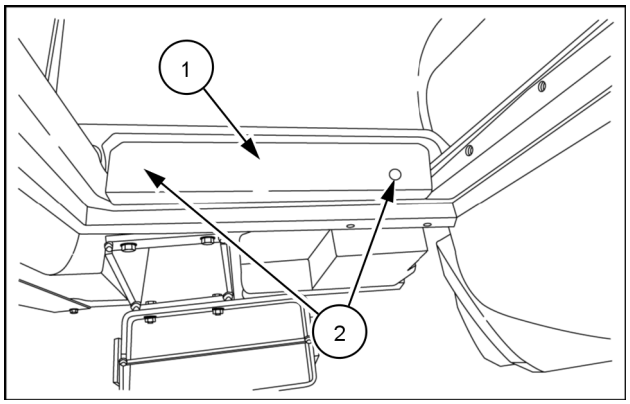
MOIL16TR03197AA 4

10. Carefully position the mat **(1)** on the floor of the cab, inserting the front part first under the dashboard.
11. Correctly position the rear part of the mat **(1)**, being careful to align it with the locations of the levers and the fasteners of the cab side panels.



MOIL16TR03198AA 5

12. Retrieve and thoroughly clean the left side scuff plate **(1)**.
13. Correctly position the left side scuff plate **(1)** in its location on the floor mat and tighten the two securing screws **(2)**.
14. Repeat the above steps for the right side scuff plate.



MOIL16TR03194AA 6

Next operation:
A. Refit the right side panel of the cab – See **Cab right-hand side panel - Install (90.160)**.
B. Refit the left side panel of the cab – See **Cab left-hand side panel - Install (90.160)**.
C. Refit the gear range lever - See **Range control lever - Install (21.130)**.
D. Refit the gear shift lever - See **Gear control lever - Install (21.130)**.
E. Refit the parking lock lever - See **Reverse control lever - Install (21.130)**.
F. Refit the seat suspension base or support (seat with mechanical suspension) – See **Seat suspension base or support - Install (90.120)**.
G. Refit the seat suspension base or support (seat with air suspension) – See **Seat mounting plate - Remove (90.124)**.
H. Refit the front panel of the cab – Right side – See **Cab right-hand side panel - Install (90.160)**.

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